

The Children's Hospital of the Future: A Vision That Meets All Needs

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Abstract

Objectives: The objective of this article is twofold. First, to present a comprehensive internal assessment of the hospital by different groups of stakeholders and, second, to determine whether there are common needs and wishes that, if incorporated in the hospital vision, will enable future development. **Background:** The Children's Memorial Health Center is the largest children's hospital in Poland. The hospital began operations in 1977 with a vision to be a modern healthcare facility that provides comprehensive care for children. That vision has not changed over time but everything else did. **Methods:** Six design thinking sessions were conducted with 83 employees and 40 respondents who used health services in the hospital in the past, along with in-depth interviews with 25 representatives of management to gather data for the hospital assessment. **Results:** Sixty-three features influencing future development were identified. Seven groups of features were classified to be either transformation drivers (four groups) or enablers (three groups). We focused on features that were indicated by all groups of respondents to define a common vision for future development. **Conclusions:** Depending on the respondent's role in the healthcare ecosystem, the list of variables within each of seven groups defining the "hospital of the future" was different while evaluating the healthcare services. Therefore, all stakeholders must be engaged in the ideation process to create a strategy for a future care model driven by innovation.

Keywords

patient-centric healthcare, improving quality of care, hospital innovation, design thinking in healthcare

Emerging innovations such as artificial intelligence are impacting all industries, including the healthcare industry. An overarching theme of the Global Innovation Index in 2019 was "Creating Healthy Lives—The Future of Medical Innovation" (Global Innovation Index, 2019). Innovation has multiple dimensions and can help close several gaps in healthcare, including those in core science, drug development, care provision, and organizational and business models. The concept of innovation is widely

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covered in the literature through innovation theory (Andersen, 2008). Innovation in organizations, including hospitals, can be either a top-down process (initiated by management) or a bottom-up one initiated by the end-user (patient or employee, depending on the dimension being analyzed; Fuglsang, 2010).

In both developing and industrialized countries, children's hospitals are specialized healthcare facilities that play an important role in healthcare systems. Patients of all ages require healthcare services that address their unique health needs. Involvement in the treatment process is particularly important for children and their families if desirable health outcomes are to be achieved (Casimir, 2019). At the same time, changes in disease patterns, disabilities, and social determinants that impact children's lives are causing their healthcare needs to evolve. For example, infectious diseases have become easier to prevent and cure; however, new ones have emerged and are challenging health systems worldwide. Another group of challenges results from rare diseases, including metabolic diseases, and some neonatal and other complex conditions, all of which require highly specialized care in health centers (Royal College of Physicians of Ireland, 2015).

The research aims, first, to present a comprehensive assessment of the Children's Memorial Health Center (hereinafter called CMHC) by employees (health professionals and administration, and hospital management) and respondents who used health services there in the past year and, second, on the basis of this assessment, to determine whether there are common needs and wishes that, if incorporated in the CMHC vision, will enable creating a vision of future development.

The CMHC, is a 13-story hospital with a training center, began operations on June 1, 1977, International Children's Day. The original vision for the hospital was for it to be a modern healthcare facility, where children from throughout Poland would receive comprehensive care that would go beyond just medical treatment. This vision has not changed over time. The CMHC remains the country's largest children's hospital, with over 25,000 hospitalizations and 17,000

patients annually (The National Healthcare Fund Database, 2020). It is seen as one of the most highly specialized healthcare facilities in Poland. Under the government's most recent financing reform, the CMHC was classified as a national hospital. The CMHC sets the standards for other highly specialized children's hospitals in Poland and pioneers innovative therapies thanks to its research institute. It is also aligned with global standards in medical treatment and cooperates with other highly specialized healthcare facilities abroad.

In Poland in 2019, there were 437 hospitals providing care for children: 420 pediatrics (general or specialist) departments in general hospitals, 14 independent children's hospitals, two university children's hospitals with highly specialized pediatric centers, and a mother and child center (The National Healthcare Fund Database, 2020). While these hospitals have witnessed a major change in the healthcare system in recent decades, the services they provide are financed principally through Poland's social security scheme.

Method

The research methodology was designed to enable a comprehensive organizational assessment to be conducted. The research methods and techniques included design thinking and in-depth interviews (IDIs) and were selected for each stakeholder group to enable comprehensive data collection. The participants in the design thinking sessions and respondents to the interviews were asked to share their impressions on (1) the relatively current situation, (2) their vision of the future, and (3) their ideas for ways to implement their vision.

Two design thinking sessions with respondents who used health services provided by the CMHC in the past year (hereinafter called "the respondents") were conducted along with four sessions with employees who have direct contact with patients: administration, nurses, and physicians with specialization and physicians in training. Additionally, 25 IDIs were conducted with representatives of management to provide not only their impression on the above three themes

but also to provide a wider organizational context. All participants of the design thinking sessions and IDIs gave their informed consent to the data being collected.

Design Thinking

An approach to problem-solving, design thinking is based on participants' engagement, and, consequently, it is described as a route to human-centered innovation (Plattner et al., 2009). Its theoretical foundations go back to the 1950s when John E. Arnold, at Stanford University, combined his expertise in psychology and mechanical engineering to teach about creative thinking for solving technical problems. Today, there are several definitions of design thinking. For the present article, design thinking is considered a methodology (Meinel & Leifer, 2010) that provides a framework for defining challenges individuals are facing. It addresses these challenges and designs potential solutions (Dorst, 2015).

Meeting patients' needs, the primary aim of healthcare providers, requires continuous innovation. Design thinking in healthcare can lead to innovative, effective, patient-centered solutions (Altman et al., 2018). Its application, which can vary across the healthcare ecosystem, is intended to engage stakeholders in the process of problem-solving in order to shape usable and acceptable interventions. This can involve solutions offered by a hospital or health professional to patients, as well as by a hospital to an insurer (financing institution) or a health professional (employee). The term "stakeholder" can also refer to caregivers and family members, each of whom can play an important role in medical treatment, especially for children.

Another argument for using design thinking is that it can help close the gap between designing an intervention and implementing it by incorporating patients' needs and feedback (Munro & Savel, 2016). An iterative process, it is intended for delivering solutions (interventions) that prioritize users' needs. This helps stakeholders engaged in designing a solution or intervention feel empathetic and share their input during all stages and rounds of ideation, prototyping, and testing of the outcome. Three components of

design thinking are particularly important for this research: (1) assessment or description of stakeholders' needs, (2) iterations with stakeholders with their feedback while designing the outcome, and (3) testing the solution (intervention).

Other studies that applied design thinking methodology in healthcare have shown that tension can occur between patients and health professionals (Altman et al., 2018). This tension results from the difference between what patients want and what health providers find beneficial for patients. Therefore, separate design thinking sessions were conducted for groups of employees and the respondents who used health services provided by the CMHC in the past year.

All design thinking sessions were conducted by trainers with certificates from the Design Thinking Institute, ensuring that quality materials were produced and the design thinking framework was maintained. One session with the respondents (September 28, 2019) and all sessions with employees (September 26 and 27, and October 3 and 4, 2019) took place in the hospital. The second session with the respondents took place outside of the hospital in the headquarters of the Children's Innovators Club Foundation on September 14, 2019.

Overall, the participants' input during the sessions provided answers to the following themes: (1) What is the hospital like today? (2) What should the hospital look like in the future? and (3) What should be implemented/changed to lead the hospital into the future to link today and the future? Each stage of each session with each group of stakeholders was summarized. The prototypes of solutions were presented using post-it notes and also documented (pictures were taken).

IDIs

Interviews are an important research tool that can provide sensitive and insightful information about an organization and help researchers better understand how it functions. IDIs can also be used to conduct some in-depth reconnaissance before conducting further research, including configuring focus groups or constructing an

overall research strategy (Adams, 2015, p. 494). The semi-structured interview is a guided conversation around a set of themes employed to answer a specific research question. At the same time, the open-ended nature of dialogue is designed to encourage participants to share thoughts and ideas researchers have not anticipated (Barrick, 2020). The target group for the 37 IDIs included all hospital directors and heads of clinics and other units. The rationale for selecting this group was that managers make decisions that should address problems within the organization and that potentially influence the direction of its development. It is therefore vital to explore their ideas and motivations individually to gain a holistic view of the organization and enable them to share thoughts they would likely be less willing to share in a group or with other employees. Of the 37 hospital directors and heads of units, 25 were interviewed between August 8, 2019, and September 6, 2019, by experienced researchers. The interviews were semi-structured. The interviewers followed the interview questionnaire, which included the following themes: the motivation to work there; key areas for improvement; current challenges for managers, other employees, and patients; a description of the hospital of the future; top issues that require change; and experience in implementing changes. All interviews were conducted at the hospital.

Data Analysis

All documentation from design thinking sessions and transcriptions from the IDIs were analyzed. This analysis led to the identification of 63 features that were indicated in total by groups of stakeholders—the respondents, employees: health professionals and administration, and hospital management—heads of hospital units and clinics. These features were organized into seven groups which together lay out a vision of the hospital of the future. Finally, the groups were divided into two categories: (1) drivers, or elements that are necessary to meet the stakeholder needs by the hospital of the future; and (2) enablers, or elements that are essential in facilitating the change from today's hospital to the future vision of the hospital.

Results

In addition to the above, four groups of transformation drivers were identified: (1) patient-centric experience, (2) digitalization, (3) collaborative care, and (4) care transition. Beyond these drivers, three groups of enablers were identified during the design thinking sessions and IDIs. These enablers will not only trigger the hospital's transformation but facilitate its future development. They comprise the following groups of features: (1) financing model, (2) workplace environment, and (3) innovative environment (Table 1).

Transformation Drivers

The first group of drivers helps assess patients' needs in their first contact with a hospital. The respondents identified the problem of not knowing what to expect or do prior to the patient's admission to the hospital. In their first contact with the hospital, one of the parents stated that "each time you have to explain what you are here for and whether the child is prepared."

The respondents reported feeling anxiety prior to the child's admission because they did not know how to prepare for it. The need for information and the "welcome experience" to be improved were therefore indicated, as the overall admission process was assessed as not patient-friendly, with communications either inaccurate or unclear and the simple administrative task taking too long: "The first day of hospitalization is always frustrating, waiting a lot, losing time (. . .). Each time I also answer the same questions about the child's illness." Respondents attributed all these inefficiencies to the hospital's being ill-prepared, uncaring, or failing to provide personalized care: "I felt like I was in such a dark forest all the time (. . .) so completely vulnerable."

Inefficiencies in time management were also indicated during the sessions with the hospital employees, especially with administration staff "(. . .) lack of orientation in the hospital and lack of information for parents, poor signage of rooms, an unclear procedure for admitting patients (. . .)." The need for educational materials about preparing for a hospital setting (the first touch-point) has been recognized by several renowned

Table 1. Categories for groups of features and individual features that were identified by respondents.

Categories	Groups of Features	Features
Drivers	Patient-centric experience	<ul style="list-style-type: none"> • Understanding patient needs • Preparing the visit • Welcome experience • Clear communication • Caring Staff • Saving time • Friendly environment
	Digitalization	<ul style="list-style-type: none"> • Digital infrastructure • New technologies for medical and administration staff • New technologies for patients • Paperless hospital • Data analytics and artificial intelligence (AI) • Cybersecurity • Interoperability
	Collaborative care	<ul style="list-style-type: none"> • Engaged patients • Engaged parents • Hospital-parent cooperation • Doctor to doctor • One team • National healthcare system hub • Community and stakeholders • International collaboration
	Care transition	<ul style="list-style-type: none"> • Engaged volunteers • Teleconsultations and telerehabilitation • Remote patient monitoring • Health assistants (AI) • Personalized medicine • Chronic care support • Electronic medical records and patient portals • Second opinion • Social support
Enablers	Financing model	<ul style="list-style-type: none"> • Special needs education • Modern reimbursement scheme • New revenue streams • Fundraising activity • Investments in improving efficiency and processes • Procurement optimization
	Workplace environment	<ul style="list-style-type: none"> • Preventing burnout • Working conditions • Modern tools • Management and leadership • Organizational culture • Training and development • Attractive remuneration
	Center of innovation	<ul style="list-style-type: none"> • Strategic focus • Innovation processes • Partner ecosystem • Pilots and testing • Academic collaboration • Industry collaboration • Applications and products

hospitals, including the Children’s Hospital Colorado in the United States (Children’s Hospital Colorado, 2013) and the Necker Children’s Hospital in Paris in France (L’Hopital Universitaire Necker, 2017). The CMHC also provides its patients with leaflets about treatments and educational materials. Nevertheless, as it was discovered during the design thinking sessions and IDIs, there is still a need to improve patient education and coordinate the process of preparing for hospital treatment (as well as to continue patient education once patients are discharged).

The next touchpoint in the patient pathway is admission to the hospital. The administrative proceedings during the admission process and time spent on waiting to be admitted could be avoided by better planning patient volumes and the administrative workforce as well as leveraging technology such as queue management apps, online registration forms, or self-check-in kiosks. Such kiosks proved particularly effective in reducing waiting times in an emergency department in the United States (Mahmood et al., 2020). However, when a wait was unavoidable, patients and their parents at the hospital were informed of the predicted wait time and had access to a comfortable waiting room, including access to food and beverages, improving the overall prepatient experience.

The second group of drivers encompasses features that have grown out of continuous digitalization. Numerous examples of digitalization can be seen at US children’s hospitals, where new technologies have been incorporated in clinical practice and patient pathways. Boston Children’s Hospital is a veritable frontier of new technologies, such as the voice assistant technology it employs to enhance its clinical practice. Using the technology itself, however, has not stopped hospital researchers from exploring pediatric providers’ attitudes toward digital voice assistants in other US hospitals. The nationwide study found that only one eighth of respondents currently use this technology, while half of respondents were interested in trying voice technology in the future (Wilder et al., 2019).

These findings, along with input from health professionals during the design thinking sessions in the CMHC, suggest that generally speaking,

employees are open to exploring new technologies, and their positive attitude can contribute to the successful integration of new digital solutions in the workplace. In the present study, all groups of respondents in all of the design thinking sessions as well as in the IDIs underscored the need to design and implement a digital infrastructure for future development, although each group justified it differently. The respondents indicated that new technologies should be made available (“You can ask Alexa for navigation and Alexa will tell you where to go”). Medical staff expressed an interest in new technologies to support communication with patients and clinical data analysis to save time for more complex clinical conditions and questions from patients: “I would like the whole medical staff to work on electronic documentation, not paper, which wastes a huge amount of time, especially with short hospitalizations and the largescale rotation of patients.”

Administrative staff emphasized the need for digital capabilities, including self-service (“We need full digitization, automation, and autonomous patient service”). This group also identified challenges in coordinating care with healthcare facilities outside of the hospital (“in Poland, when there are more than two people involved . . . it is impossible to coordinate care”; “the hospital of the future should be clearly with electronic communication laying out where the patient needs to go”; and “Care should be continued after the patient is discharged from the hospital . . . , such as visit reminders and contact with medical staff”).

For hospital directors and heads of units, the key digitalization-related issues included sources of financing for the digital transformation to ensure connectivity and patient data security, as well as leveraging data analytics for improving business operations (“we have our own genetic database system, which, for safety reasons, is separated from hospital data, but it’s an old system we cobbled together with money leftover from another project, so it’s outdated”).

Technology can play a role in improving collaborative care in the healthcare system—but only if the organizational culture is prepared for it to do so. For that to happen, all employees in

the healthcare organization need to align their efforts to cooperate with patients and their parents as well as with the healthcare organizations and stakeholders outside of their organization. Team collaboration can be a valuable asset that enables effective clinical practice while minimizing medical errors (O'Daniel & Rosenstein, 2008). The third group of transformation drivers comprises all dimensions of collaborative care, including collaboration between the following stakeholders: (1) health professional and patients; health professionals and parents; (2) healthcare organizations and parents; (3) health professionals within the hospital with other health professionals from outside the hospital; (4) health professionals and administrative employees and management; (5) healthcare organizations and other stakeholders in the national healthcare system, including local communities, nongovernmental organizations, and volunteers; and (6) domestic and foreign healthcare organizations.

All groups of respondents underscored the need for closer cooperation in the hospital setting and beyond, for example, with primary care facilities, other health facilities, and schools. The respondents reported that “we should move more activities to the patient’s home so that he can do it alone or with his family, for example, with the support of an application or a virtual medical assistant.” For their part, healthcare professionals supported closer interdisciplinary team collaboration and knowledge sharing across the hospital setting. “There used to be meetings of the clinic managers and they knew what was going on.” Administrative staff see value for patients in efforts to improve external communication and perceive all hospital employees as a single team—“(.) this should be an operational goal, (.) for patients’ greater good.” Hospital directors and heads of units emphasized that international collaboration could be beneficial for career development, organizational and clinical excellence “[there is a need to:] send our employees abroad for training, including about the culture of work (.); to create additional incentives, for example, career development opportunities including secondments to foreign hospitals as well as bringing in foreign specialists to teach their national counterparts.”

The fourth group of transformation drivers identified during the design thinking sessions and interviews concerns the provision of healthcare close to patients’ homes. The respondents reported the need to stay somewhat connected with the hospital medical team after the hospitalization as they could answer questions about the children’s health condition which did not come up before they were discharged (“At the beginning of my daughter’s illness, I had training for ‘fresh diabetes.’ Now she is growing up and her needs are changing (new drugs, new insulin pumps), and I lack help in regularly updating my knowledge”). Both health professionals and administrative employees suggested that remote patient monitoring can save all stakeholders time, particularly for chronic conditions (“a database is needed for the diagnoses of children and monitoring the progress of their treatment”; “[internal communication] automatic mails, like in the hospital in Stockholm, this improved the situation (...) and information flow; (...) earlier it was constantly traveling back and forth (...) also plain and good [external] communication (...) this could help a patient get where they need to get”).

The hospital directors and heads of units stressed that if electronic medical records were implemented, even if an unexpected acute condition appeared, patients and specialists could access, even from home, all the information they would need to act quickly and appropriately for the situation, without the need to travel hours to the CMHC (“[we should (.)] bring more activities to the patient’s home so that he can do it alone or with his family, e.g., with the support of an application or a virtual medical assistant”). In addition to accessing medical records and maintaining communications with the hospital staff, it was also important for the respondents to coordinate further scheduling treatment with a return to school. (“We are not much on time because we have rehabilitation until 1 p.m. And we only make it to art class at the end”).

Transformation Enablers

The first transformation enabler concerns the source of financing for new healthcare models and innovative technologies. While all groups

of respondents alluded to this, the hospital directors and heads of units elaborated on current challenges with the payment mechanisms in the healthcare system: (1) “Contracts with the National Health Fund limit patients’ benefits. A good hospital in Poland is one that does little to incur debt”; (2) “the CMHC is a highly specialized national hospital but it is funded like a regional, general hospital”; “the healthcare system is notoriously underfunded”; (3) “contract constraints are absurd, I want a given patient to have X-rays, a heart examination and Holter examination because they should be done but I can’t link these services—I have to choose one.”

Aside from struggles resulting from the reimbursement scheme, the sustainability of financing is another concern for managers who have implemented projects involving innovative technologies. This is especially true if those projects have been cofunded from EU funds and their exploitation or maintenance costs result in budgetary hardship for a health organization’s management (Gordon, 2009).

The second group of enablers revolves around the culture that supports innovation, including the following major features: (1) establishing an innovation center (hub) in a hospital setting; (2) creating and nurturing innovation culture; (3) partnering with external organizations for designing, prototyping, and testing innovative technologies; (4) collaborating with academia; (5) commercializing know-how through spin-offs, joint ventures, and licensing; and (6) creating a network of organizations supporting innovation, including authorities, patient advocate groups, and industry players.

All groups of respondents included some form of innovation in their vision of the hospital of the future. The respondents emphasized innovations for their convenience (“A silent flying robot that will replace a nurse, for example, to measure temperature and blood pressure or change out cannulas”). Medical professionals indicated that they are open to trying new technologies and are not afraid of changes in clinical practice, while administrative staff expressed an interest in reducing administrative overload by leveraging new technologies “(.) reducing unnecessary tasks. We are burdened with a large amount of paper

documentation.” The hospital directors and heads of units stressed that innovative technologies are a must-have for future development and maintaining excellence in their region. At the same time, they expressed concerns about balancing their hospital’s budget and saw an opportunity in collaborating with external organizations to facilitate the implementation of digital transformation. (“There is no comfort in terms of money, insufficient funding results in performing in a state of emergency [...] making it difficult to achieve long-term goals”; “[The foundation] could help with implementing new technologies and IT infrastructure”).

Some changes toward innovation do not require ongoing, statutory funding, and one-time implementation can have an impact on the quality of the stay for patients and the overall experience for parents and healthcare professionals alike. The Pedestrian Metro System the CMHC has implemented is an example: With seven “lines”, it helps people in the hospital orient themselves and get where they need to be. Connected with the Patient Application, this internal navigation system reduces stress.

Achieving a truly innovative environment is a long-term goal. In the meantime, working in an antiquated infrastructure, hospital staff must sink a great deal of time into simple, daily administrative tasks, often leading, as emerged during the interviews, to burn-out. At the same time, they are aware that digitalization would increase the capacity for more interesting and challenging tasks. The transition period such digitalization would require, however, would be a problem: It would call for increased engagement in improving the clinical practice and everyday business operations and investing additional time in the future development while the capacity for that is severely limited.

The third group of enablers comprises components of a healthy workplace. It covers efforts including treating everybody with respect, making continuous efforts to maintain good communication and collaboration across the hospital setting, and preventing employee burnout. Patients and their parents need hospital staff to be caring and empathetic. The respondents desired to be treated individually and not like numbers (“Nurses very

often remember kids, which is really nice”) and to have health professionals acknowledge their needs (“Some part of parents’ behavior is attributable to enormous stress, which I did not realize until my friend’s daughter died in an accident”; “Communication culture is very important in the West—the child comes first, staff should understand this from the start”).

For their part, health professionals expressed the need to treat patients individually but being often overworked and at risk of burnout makes doing so a challenge (“Staff is burnt out, the staff is very busy, they work in several places at once”). Administration indicated possible tensions between them and clinicians regarding managing patients’ medical records (“Physicians are not willing to use electronic documentation, not sure if it is possible to convince them to do this”). The hospital directors and heads of units stressed the challenges associated with workforce shortages and the need to retain talented healthcare professionals despite limited options for providing financial incentives (“the main reasons for resigning from work are financial. It is very difficult to build a team in such conditions”).

Discussion

Using IDIs and design thinking in the CMHC, we identified features which, taken together, describe “the hospital of the future.” The vision defined as a set of common features for all stakeholders (the respondents who used health services, medical and administrative staff, and managers) provides the foundation for a strategy or a road map that could be used to execute the vision. Identifying enablers led us to create a framework for analysis in order to establish which prerequisites can trigger changes toward the vision of the hospital of the future. This framework also enabled us to observe correlations within groups of drivers and groups of enablers.

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Advancements in technology and medicine provide ample opportunities to improve the

patient experience and health outcomes. These advancements far outpace the changes occurring to financing schemes in healthcare systems. Financing high-quality healthcare, including innovative solutions, has been a primary area of focus for policy makers and healthcare executives for decades. A well-adjusted financing model influences all drivers and is crucial for digitalization. While the need for digitalization may seem obvious, implementation can be complicated, especially in public hospitals where the infrastructure is old, and budgets are stretched for fixed asset investments.

Public financing of hospital care, even it is done on a fixed budget, continues to depend on diagnosis-related group (DRG) payments, which are calculated on an average cost basis. This means that, at least in theory, the cost of technology, including digitalization, should be included in the DRG payments. The findings from the interviews suggest that this theory is not reflected in CMHC’s practice, causing it to experience financial hardship. More widely, the financial struggle of healthcare providers and limited options for implementing expensive innovative technologies has been acknowledged at the national level and the National Health Fund leads efforts to improve the situation by introducing Hospital-Based Health Technology Assessment (HBHTA, 2020). Once it is introduced, it could potentially support the testing and implementation of innovative technologies along with ongoing digitalization. Hospitals including CMHC will, until then, have to rely on additional financial resources such as charity funds.

A well-adjusted financing model can also incentivize a patient-centric approach and collaborative care. For example, incentives could be embedded in DRG payments to increase quality and coordination of care. Finally, a financing system can fulfill the need for covering costs of transition care. In a properly designed value-based payment system, the payment should not cover only a single service provided by a healthcare provider, but the bulk of services organized in cooperation between

healthcare providers across specialties and types of services.

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It seems that the organizational culture that supports innovation can be an important enabler not only for digitalization but also for care transition. Well-established communication with stakeholders outside of the hospital should help incorporate healthcare services with everyday life, including children's education and parents' work.

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Last but not least, the hospital of the future should be a great place to work. A good workplace environment enables a patient-centered approach and collaborative care. Employees will have opportunities for training and career development along with attractive remuneration and thus are more engaged and willing to go beyond the basic standard of services. This also will lead to greater patient satisfaction (Panagioti et al., 2018).

... the hospital of the future should be a great place to work.

As established above, drivers and enablers interact with each other. Digitalization can trigger patient-centric experience and collaborative care. Digital transformation is ongoing and presents hospital management with challenges as it faces expectations from both patients, medical staff, and administration. The hospital of the future should be equipped with an IT infrastructure that combines all perspectives to provide seamless care, with robotic process automation and digital communication for both simple administrative tasks such as gathering data about patients' conditions, and more advanced ones, including data analytics to support clinical decisions. All digital features should be aimed at ensuring personalized

care and face-to-face interaction for cases requiring more elaborate explanation. These are essential for achieving desirable health outcomes.

Digitalization can trigger patient-centric experience and collaborative care.

The sustainability of innovative technologies can also be challenging for healthcare organizations because their implementation is not static. Sustainability requires an ongoing process that adapts the service to new technological trends and changes to financing mechanisms and regulations to ensure that healthcare services are both high-quality and safe. In the overall policy context of the e-health market, a sustainable telemedicine service would be able to provide the service over the long run, not only during a state of emergency such as a pandemic. In Poland, the SARS-CoV-2 pandemic has not only kick-started telemedicine in earnest but also shortened the conversion period, which, again, can be a major obstacle in implementing e-health solutions.

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Digitalization can also enhance smooth transition of care from a hospital to patient's home. Hospitalization disrupts the regular lives of patients and their families. Once discharged from the hospital, it is vital to sustain the health outcomes made possible by the hospitalization and ensure care close to home. Teleconsultations and tele-rehabilitation can be used to these ends. Some groups of patients may require health condition monitoring at home, a process that can be enabled by digital tools. However, in some conditions, the support of a medical assistant may be required to carry out everyday activities. Complementary support such as social services and educational services should also be available for children. Otherwise, hospitalization can have a long-term negative impact on children's performance at school and potentially lead to

inequalities in education (Bortes et al., 2018). In the United Kingdom, an innovative solution for children with long-term diseases missing school has come in the form of a robot to connect the child with the classroom and classmates (No Isolation Project). It helps the child keep up with the educational materials while going some way toward mitigating the consequences of home isolation.

Aside from the technological issues, however, the human factor must also be taken into consideration. A collaborative patient-centered approach should be embedded not only in the health organization's culture but in the entire healthcare system. That's why patient-centric experience can trigger effective collaborative care. Such care can also be accomplished by sharing expertise in pediatrics with healthcare organizations internationally and enabling healthcare professionals to exchange knowledge and best clinical practices to improve health outcomes based on evidence-based medicine.

Collaboration can also involve nonhealth organizations including schools, universities, charity institutions, and community centers, among others. Creating a network of collaborative institutions could not only improve patient experience but also enrich the services offered by a healthcare organization and provide assistance. So, collaborative care may be said to influence care transition. Such a collaborative network would (1) bridge the gap between the hospitalization and prehospital life by staying connected with schools, for example, by enabling educational services in the hospital setting; (2) assist the workforce by supporting the execution of simple administrative tasks, which can be assigned to volunteers and interns; and (3) create financial assistance by engaging external organizations, such as local authorities, charity organizations, research institutes, and other organizations interested in supporting the implementation of innovative care models and technologies. Of course, financing such coordination is an endless challenge, one only complicated by the cross-industry dimension. For example, even where there is financing for medical staff to coordinate care, there may be no legal framework to finance the educational sector, for example, with funds

earmarked for healthcare (which are supposed to cover the costs of healthcare services).

A correlation between enablers also can be observed. Healthcare professionals who are overworked and at risk of burnout can jeopardize patient care. The key challenge for managers is to prevent burnout and invest in efforts to improve staff wellness. The use of innovative technologies can help address challenges with work overload by supporting relatively simple tasks, for example, via automation or clinical decision tools backed by artificial intelligence. Employing such technologies makes it possible to serve more patients and spend more time on complex conditions. Additionally, if the financing model is designed well, there are sufficient financial resources to back up financial incentives for maintaining high-quality work, providing opportunities for continuous training, or achieving new skills. Also, temporary leave-taking should be made an option to prevent health professionals from resigning from work in hospitals. An innovative organizational culture with simplified processes and modern tools that support collaboration between different teams also will play an important role in overall employee satisfaction. Building an employee-friendly brand can also reduce the hurdles caused by workforce shortages. More individuals would be drawn to apply for a position in a hospital that provides an attractive work-life balance.

Conclusions

A complete separation between pediatric and adult medicine occurred in the 20th century. Children's hospitals have become vital to the healthcare system as they contribute to advancements in research, the use of innovative treatments, and quality care. However, as other hospitals have found, excelling in clinical care and investing in innovation while facing budget constraints in delivering basic healthcare has proved difficult.

The research findings presented in this article show that incorporating a comprehensive organizational assessment by employees and respondents who used health services in the past can be used to identify common needs. This assessment can help the hospital plan and improve the quality of care

and the overall patient experience. Achieving best possible health outcomes is the foremost priority for all healthcare providers regardless of their role in the healthcare system. Keeping patients at the center of care is therefore essential. To make this happen, healthcare organizations can employ comprehensive assessments based on design thinking and IDIs to better understand patients' needs. The patient-center approach is a crucial transformation driver that should be applied from the outset of interaction between the patient and the healthcare organization.

The key challenge in implementing this approach is in achieving sustainable data collection and the evaluation of patient satisfaction. Another challenge is to reconcile what patients find the most important in healthcare and what healthcare providers find beneficial for the best possible health outcomes. That is why analyzing both perspectives and working to bridge them is crucial for building the hospital of the future.

The analysis of results of design thinking sessions and IDIs has shown that there are features common for all groups of stakeholders. These features were grouped into drivers and enablers. The drivers' group represents a patient-centric approach, digitalization, collaborative care, and care transition. Other groups of features acted as facilitators or enablers of transformation drivers. These include financing model, innovative environment, and workplace environment.

In creating the vision of the future, the healthcare organization's unique circumstances and its role in the healthcare system need to be taken into consideration and addressed by all stakeholders. Features common to these groups should be a basis for executing the vision of the hospital and can be a determinant of accepting a strategy for the hospital's transformation. Additionally, engaging all stakeholders in the process of building the future direction of development may facilitate its execution. The general framework described in this article may be useful in planning the development of other children's hospitals. The four drivers and three groups of enablers identified are key components of the definition of "the hospital of the future," though the list is not necessarily exhaustive.

Work that remains to be done includes, first, further exploring potential components and, second, validating the list of transformation drivers and enablers in a different hospital setting and in various groups of patients and hospital employees. The latter is particularly important because our findings are limited to those respondents who participated voluntarily in the design thinking sessions: a random sample of people who used health services provided by the CMHC in the past year, 59 health professionals, and 24 administrative employees. The data are self-reported and these respondents—volunteers could potentially be more open toward innovation and changes brought on by innovative technologies in the CMHC. The findings are also based on a country-specific healthcare financing scheme, a fact reflected during the IDIs with 25 representatives of management.

Digital transformation in healthcare is gaining momentum. A patient-centered approach will be crucial to the process. Those healthcare systems and organizations that do not or cannot embrace technological advancement in medicine and learn about patient experience will lag behind, losing their trust. In the best-case scenario, they will miss opportunities to grow; in the worst case, they will lose their relevance and potentially cease to operate.

A patient-centered approach will be crucial to the process. Those healthcare systems and organizations that do not or cannot embrace technological advancement in medicine and learn about patient experience will lag behind.

Implications for Practice

The research outcomes and findings presented in the article

- can be used in the discussion on reorganizing healthcare systems toward patient-oriented and value-based solutions;
- extend the knowledge of using design thinking and IDIs in hospitals to improve the

quality and prepare patient-centric vision and strategy in a hospital;

- provides a framework for assessing, preparing or revising the hospital vision and strategy; and
- can be directly applied by other researchers and healthcare systems practitioners.

Data Availability Statement

Pictures from the design thinking sessions and a file with anonymized data from the interviews are available on request.

Declaration of Conflicting Interests

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Declaration of Conflicting Interests

Verbal informed consent was obtained from all participants of the design thinking sessions and in-depth interviews. The Chairman of the Bioethics Committee at the CMHC waived the need for the approval as research did not involve patients during the medical treatment in the CMHC.

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