



## Short Communication

# “Cells at Work VR”: The Development of a Virtual Reality Application for Pediatric with Cancer Patients Utilizing Japanese Animation Characters

Isamu Saeki<sup>1\*</sup>, Sho Kurihara<sup>1</sup>, Shuhei Karakawa<sup>2</sup>, Aya Fujiwara<sup>3</sup>, Aoi Takeda<sup>4</sup>, Satoshi Okada<sup>2</sup>, Shinya Takahashi<sup>5</sup>, Eiso Hiyama<sup>1</sup>

<sup>1</sup>Department of Pediatric Surgery, Hiroshima University Hospital, Hiroshima, Japan

<sup>2</sup>Department of Pediatrics, Hiroshima University Hospital, Hiroshima, Japan

<sup>3</sup>Child Life Specialist, Hiroshima University Hospital, Hiroshima, Japan

<sup>4</sup>Pediatric ward nurse, Hiroshima University Hospital, Hiroshima, Japan

<sup>5</sup>Department of Surgery, Graduate School of Biochemical and Health Sciences, Hiroshima University, Japan

**\*Corresponding author:** Isamu Saeki, Department of Pediatric Surgery, Hiroshima University, Hiroshima, Japan

Kasumi 1-2-3, Minami-ku, Hiroshima 734-8551, Japan

**Citation:** Isamu Saeki, Sho Kurihara, Shuhei Karakawa, Aya Fujiwara, Aoi Takeda, et al. (2026) “Cells at Work VR”: The Development of a Virtual Reality Application for Pediatric with Cancer Patients Utilizing Japanese Animation Characters. Arch Pediatr 11: 343. DOI: 10.29011/2575-825X.100343

**Received Date:** 25 May 2026; **Accepted Date:** 04 June 2026; **Published Date:** 08 June 2026.

## Abstract

“Cells at Work VR” is the world’s first virtual reality (VR) application utilizing licensed Japanese animation characters specifically developed for pediatric cancer patients. VR is increasingly employed as a tool for pediatric distraction, and specialized VR applications are being designed to support the treatment of childhood illnesses. In 2022, we initiated a game development project utilizing Japanese anime characters to facilitate children’s understanding of medical treatment and conceptually represent the eradication of cancer cells. The application, titled “Cells at Work VR,” was completed in 2026. We are currently preparing to conduct a clinical study using this application.

**Keywords:** Child; Virtual Reality; Childhood Cancer; Cells at Work

**Abbreviations:** VR: virtual reality; NK cells: Natural Killer cells

## Introduction

The year 2016 is widely regarded as the inaugural year of virtual reality (VR), marked by the availability of VR headsets at accessible price. In recent years, there has been a notable increase in scholarly publications examining the application of VR in pediatric populations [1-3]. Initially, VR was predominantly utilized as a

distraction to alleviate pain and anxiety during medical procedures. However, it has recently been reconceptualized as a therapeutic intervention in its own right, leading to the development of VR applications specifically designed for treatment purposes [4].

## Product

In 2022, we initiated a project to develop a specialized VR application for pediatric cancer patients. This initiative incorporates Japanese animated content, specifically characters from “Cells at Work!” (Kodansha Co., Ltd., Tokyo, Japan), to create an interactive

platform that enhances children’s understanding of cancer treatment while fostering motivation. Funding for the project was secured through various activities, including donation campaigns at Hiroshima University Hospital. In 2025, we formalized a collaboration with Kodansha Co., Ltd. and Be Rise Co., Ltd. (Hiroshima, Japan), a VR production company, and in 2026, the development of “Cells at Work VR” was successfully completed (Figure 1). The system was implemented using Meta Quest 3 (Meta Platforms, Inc., California, USA) as the VR hardware platform. “Cells at Work!” is a widely recognized animated series in

Japan, particularly among children, featuring anthropomorphized representations of biological entities including red blood cells, white blood cells, natural killer (NK) cells, and cancer cells. Within the VR application, users can acquire knowledge of human physiology and oncological mechanisms, while engaging in interactive experiences that simulate the elimination of cancer cells using anticancer agents (Figure 1). This VR application is operated by the patient and includes four consecutive stories which a total playtime of approximately 30 minutes. It is designed for patients of  $\geq 5$  years of age, for use before and during cancer treatment.



© 清水茜/講談社・アニプレックス・davidproduction

**Figure 1:** Cells at Work! VR.

In “Cells at Work VR”, children with cancer can learn about the human body and how cancer works, with the added element of defeating personified cancer cells.

To date, two pediatric patients with a history of cancer (ages: 6 and 8 years) have interacted with the application, and preliminary observations indicate that it is educational and engaging. The children, along with their parents who were watching their gameplay on the screen, came up with questions about the functions of blood cells, and with their parents’ encouragement, they defeated personified cancer cells, experiencing a sense of accomplishment. We intend to further investigate the impact of this VR application on pediatric patients with cancer. Preparations

are currently underway to conduct a clinical study at Hiroshima University Hospital.

This application is designed for deployment across pediatric oncology centers throughout Japan, and VR headsets and software are available upon request.

### Discussion

The authors have actively engaged in integrating VR into medical education at Hiroshima University Hospital. We have developed VR-based training platforms, including a VR Objective Structured Clinical Examination (OSCE) system and VR software for endovascular treatment, and have conducted clinical research

**Citation:** Isamu Saeki, Sho Kurihara, Shuhei Karakawa, Aya Fujiwara, Aoi Takeda, et al. (2026) “Cells at Work VR”: The Development of a Virtual Reality Application for Pediatric with Cancer Patients Utilizing Japanese Animation Characters. Arch Pediatr 11: 343. DOI: 10.29011/2575-825X.100343

---

demonstrating their substantial educational efficacy [5,6]. The ‘Cells at Work VR’ application developed in the present study incorporates famous animated character content, thereby enhancing its relatability and immersive appeal for pediatric users. This represents a novel approach that leverages Japan’s unique cultural assets. We anticipate that this application will exert a significant positive influence on children’s comprehension of disease processes and human physiology in the future.

VR is currently being applied across a wide range of medical fields. To maximize its utility, it is essential to accurately understand the unique attributes of VR and promote applications that fully exploit its capabilities. One of the most salient features of VR is its capacity to facilitate deep immersion in entirely novel experiential environments, independent of temporal and spatial constraints, yielding substantial educational benefits. VR-based education has already been demonstrated to be particularly effective in pediatric populations [1-3], and we anticipate continued advancements in the development of VR applications for pediatric therapeutic use.

The content of this study was presented at the 67th Annual Meeting of the Japanese Society of Pediatric Hematology and Oncology in 2025.

#### **Acknowledgements**

The authors thank Dr. Brian Quinn for reviewing this manuscript.

#### **Funding**

#### **Grants**

2023 Gold Ribbon Grant, 2023 Kobayashi Pharmaceutical Blue Bird Foundation, a public interest incorporated foundation, grant, 2024 6th Lemonade Stand Grant for Childhood Cancer and AYA Generation, 2024 Research Grant from the Public Interest Foundation for Protecting Children with Cancer, 2024 Relay for Life Japan “Project Mirai” Grant, and 2025 Asahi Kasei Research Grant.

#### **Support from companies and hospitals**

JMS Co., Ltd, IZUMI CO., LTD., Calbee, Inc., Seiai Medical

Corporation Gion Ushida Hospital, Meishokai Medical Corporation, and General Incorporated Association Life Security Support Center Kirari.

#### **Donation**

LIVE EMPOWER CHILDREN and Maple Kaiser. Donations were collected from the general public at the Hiroshima University Hospital.

#### **Authors’ contributions**

All authors were involved in the development of Cells at Work VR. All authors have read and approved the final manuscript.

#### **Competing Interests**

The copyright of “Cells at Work VR” is owned by Kodansha Co., Ltd. (Tokyo, Japan). “Cells at Work VR” was jointly developed by BeRise Co., Ltd. (Hiroshima, Japan) and Hiroshima University Hospital.

#### **References**

1. Comparcini D, Simonetti V, Galli F, Saltarella I, Altamura C, et al. (2023) Immersive and Non-Immersive Virtual Reality for Pain and Anxiety Management in Pediatric Patients with Hematological or Solid Cancer: A Systematic Review. *Cancers (Basel)* 15: 985.
2. Eijlers R, Utens EMWJ, Staals LM, de Nijs PFA, Berghmans JM, et al. (2019) Systematic review and meta-analysis of Virtual Reality in pediatrics: effects on pain and anxiety. *Anesth Analg* 129: 1344-1353.
3. Reitze A, Voigt M, Klawonn F, Martin Dush, Grigull L, et al. (2024) Impact of virtual reality on peri-interventional pain, anxiety and distress in a pediatric oncology outpatient clinic: a randomized controlled trial. *BMC Pediatr* 24: 501.
4. Soltiyeva A, Oliveira W, Madina A, Adilkhan S, Urmanov M, et al. (2023) My Lovely Granny’s Farm: An immersive virtual reality training system for children with autism spectrum disorder. *Educ Inf Technol (Dordr)* 1-21.
5. Saeki I, Hattori M, Kurihara S, Kojima M, Honda Y, et al. (2023) VR OSCE: Development of OSCE training material using a Virtual Reality system. *JASBEHP* 11: 108-111.
6. Mitani H, Honda Y, Narita K, Nakamura Y, Morishita S, et al. (2025) Effectiveness of a virtual reality-based interventional radiology simulator for medical student education. *Jpn J Radiol* 43: 1386-1392.