



Devanshu Pal Consulting Group
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Home Hemodialysis Machines

Report produced by
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Devanshu Pal Human Factors Consulting Group

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Dear Ger and the Home Dialysis Program,

We extend our gratitude for entrusting us with the task of conducting a thorough assessment of home hemodialysis machines, particularly focusing on their interaction with patients in non-clinical settings.

Our comprehensive report is the result of extensive research involving dialysis patient profiles, evaluations of hemodialysis machines, the landscape of home-based hemodialysis, an in-depth review of online literature, multimedia content, and user feedback.

Within this analysis, we provide insights into the usability aspects of three distinct models of home hemodialysis machines, featuring brief descriptions, notable attributes, identified areas for potential enhancement, and a comprehensive table summarizing essential user-oriented characteristics.

To conclude, we offer detailed assessments and usability rankings for each machine featured in the report. Please know that we are readily available to assist with any of your current or future requirements.

Best regards,
Devanshu Pal



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Introduction

Hemodialysis is a life-saving medical procedure used to treat individuals with kidney failure by removing waste products and excess fluids from their blood. One notable trend in recent healthcare data is the significant increase in home dialysis adoption. Over time, the percentage of newly diagnosed dialysis patients choosing home dialysis has surged from 6.8% to 13.3%. This shift underscores a growing preference for more flexible and patient-centric dialysis options, allowing individuals to receive critical care in the comfort of their own homes.

Comparative analysis

In this document, you will find the analysis of the top-rated hemodialysis machines based on their human factors engineering analysis. We have discussed,



NxStage One



Outset Tablo



Quanta SC+

You will find out the comparison of these extensively used machines based on the key features, physical design, and usability factors. As a Human factors consulting group, we ensure to guide our valuable customers with the utmost precise information about medical devices.

In case of any clarification, unanswered queries, or further investigation, please feel free to reach out to us.

NX STAGE SYSTEM ONE

The NxStage One Hemodialysis Machine, designed and manufactured by NxStage Medical, Inc. This system is known for its portability and convenience in delivering hemodialysis treatment to patients with kidney disease, allowing them greater flexibility in managing their therapy. It is a compact (18" high & 15" x 16") and innovative medical device designed to provide advanced hemodialysis from the comfort of home. This portable system offers a flexible and convenient solution for individuals seeking greater control over their dialysis therapy. Its user-friendly interface allows for easy operation, while its small footprint makes it suitable for home use, reducing the need for frequent hospital visits. The NxStage One Hemodialysis Machine delivers high-quality care, offering patients greater independence and improved quality of life by enabling them to manage their treatment on their own terms.

OUTSET TABLO

The Outset Tablo Hemodialysis Machine is a state-of-the-art medical device that revolutionizes the delivery of hemodialysis treatment for patients with kidney disease. Outset Medical is the company that designed it. This innovative machine offers a compact (35.3" high & 17.7" x 26.9" deep) and user-friendly design, making it suitable for both clinical settings and home use. Its intuitive interface simplifies operation, empowering patients to take more control of their dialysis therapy. The Tablo Hemodialysis Machine delivers high-quality care, providing a versatile and efficient solution for healthcare providers while improving the quality of life for patients by offering flexibility and ease of use.

QUANTA SC+

The Quanta SC+ Hemodialysis Machine is an advanced and compact (18" high & 15" x 15" deep) medical device designed to provide efficient and high-quality hemodialysis treatment for patients with kidney disease. This innovative machine offers a small footprint, making it suitable for various healthcare settings, including home use. Its user-friendly interface and advanced technology simplify operations, ensuring a seamless dialysis experience for both patients and healthcare professionals. The Quanta SC+ Hemodialysis Machine is designed for flexibility and precision, offering precise control over treatment parameters, ultimately enhancing the quality of care for individuals with kidney conditions. If something goes wrong with the device, the company offers to troubleshoot it within the cloud or get a new device to the user in a short period of time.

Shortcomings of these machines

Complex Setup: Users have found the initial setup of the these machines to be somewhat complex and require training.

Time-Consuming: The process of setting up and conducting a dialysis session alone with the machine can be time-consuming.

Noise: Some users have found the machines to be noisy during operation.

Limited Portability: While these machines are considered portable, they still require access to clean water sources and electrical outlets, which may limit their use in certain situations.

Cost: The cost associated with home dialysis, including the NxStage One machine and supplies, maybe a consideration for some users, even with insurance coverage.

Human factors evaluation

Human factors evaluation plays a critical role in enhancing the overall usability, safety, and user satisfaction of home dialysis machines, ultimately contributing to better patient outcomes and experiences.

During our evaluation, we considered all the necessary and required parameters of human factors based on the data available on the web. We have created a detailed comparison in the form of a table for your better understanding.

Comparison Table

Hemodialysis	NxStage One	Outset Tablo	Quanta SC+
Weight	75lbs (34 kgs)	195lbs (88 kgs)	71lbs (32 kgs)
User interface design	Intuitive design with digital display.	Highly Intuitive with LED display. Mobile app.	Highly intuitive with LED display. Mobile app.
Feedbacks and alerts	Yes	Yes	Yes
Training and education	Required (approx 2 weeks)	Required	Required
Error prevention	Yes	Yes	Yes
Accessibility	Prescription for use	Prescription for use	Prescription for use
Physical ergonomics	Easy on lifting	Not easy to lift but can be dragged with the help of the wheels.	Easy to lift
Maintenance and cleaning	Required	Required	Required
Safety features	Alarms	Alarms and easy troubleshooting	Alarms and auto-cloud troubleshooting
Compliance and regulations	FDA cleared	FDA cleared	FDA cleared
Documentation and labelings	Yes	Yes	Yes
Error recovery	Manual	Manual	Manual + Auto
User support	Available	Available	Available
Cost	\$26,000	\$47,000	\$44,333

Final remarks

Placing the Quanta SC+ Hemodialysis Machine at the forefront of home dialysis solutions is not just a choice; it's a leap towards an unparalleled patient-centered experience. Its lightweight design makes it effortlessly portable, giving users the freedom to dialyze wherever they choose. But it's not just about convenience—it boasts the most intuitive user interface, making treatment setup and management a breeze. Users have praised its seamless feedback mechanisms that keep them confidently in control. What truly sets the Quanta SC+ apart is its auto-cloud troubleshooting feature, a safety net that ensures emergencies and errors are swiftly addressed. Plus, it's FDA approved, cementing its reliability and safety, all at a medium to low cost. With Quanta SC+, we're ushering in a new era of home dialysis—one that's user-friendly, responsive, and accessible, empowering patients to embrace life beyond their condition.

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