

Human Factors Validation of the Tablo Hemodialysis System with Health Care Practitioners

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BACKGROUND

- Hemodialysis is a lifesaving treatment warranting extensive training to perform safely and effectively in different use environments.
- Shortages in nurse staffing due to the COVID-19 pandemic caused a desire to innovate systems that can be safely and effectively used by healthcare professionals (HCPs).
- The Tablo[®] Hemodialysis System (“Tablo”) is easy-to-learn, indicated for clinic, hospital, and home settings. Features include a simplified user interface, interactive touchscreen GUI coupled with videos to assist users.
- Prior usability testing of Tablo had a use error rate of 1.5%.

OBJECTIVE

Report on the results of simulated use human factors validation testing on a recent software version of the Tablo System with HCPs in the clinic setting.

METHODS

- HCPs were tested in a simulated clinic environment to validate safety and usability.
- HCPs underwent standard 3-hour training and were trained on all aspects of device operation, including:
 - Setup
 - Takedown
 - Monitoring
 - Routine maintenance; and
 - Alarm resolution
- After a decay of at least one hour, HCPs performed tasks without the trainer.
- Task performance to use errors, close calls, and difficulties were recorded, along with HCP interview data.

RESULTS

- Fifteen (15) HCPs were recruited, consisting of:
 - 9 RNs with prior HD experience; and
 - 6 dialysis technicians
- A total of 7365 tasks were performed:
 - the observed use error rate across all tasks less than <1%
 - most use errors were related to “Manual Blood Return”
- 100% of HCPs reported that they felt they could use Tablo safely and effectively.

CONCLUSION

- After standard 3-hour training, HCPs were able to safely and effectively operate Tablo in a simulated use clinic setting.
- Human Factors testing of the more recent software demonstrates further reduction in Tablo’s already low use error rate.
- This study supports prior data regarding the ability of HCPs to easily learn and use Tablo and the device’s ability to facilitate expansion of available dialysis nursing staff while increasing the quality and safety of dialysis treatments across the care continuum.

Table 1. Healthcare Professional User Task Assessments

Use Scenario	Scenario Title	Success	Difficulty	Close Call	Use Error	Total Tasks
1	Prepare System for Use	2584 (99.0%)	10 (0.4%)	-	16 (0.6%)	2610
2	Connect Patient	180 (100%)	-	-	-	180
3	Administer Treatment	1156 (98.8%)	6 (0.5%)	-	8 (0.7%)	1170
4	Complete Treatment & Disconnect Patient	820 (99.4%)	4 (0.5%)	-	1 (0.1%)	825
5	Perform Manual Blood Return	230 (95.8%)	5 (2.1%)	-	5 (2.1%)	240
6	Cleaning, Disinfection, and Routine Maintenance	1518 (99.2%)	6 (0.4%)	-	6 (0.4%)	1530
7	Respond to Alarms	329 (99.7%)	1 (0.3%)	-	-	330
8	User Manual Comprehension	360 (100%)	-	-	-	360
9	Service and Miscellaneous Observations	120 (100%)	-	-	-	120
Total		7297 (99.1%)	32 (0.4%)	-	36 (0.4%)	7365