

Continuous recording of vital signs with a wearable device in pediatric patients undergoing chemotherapy for cancer – a feasibility pilot study

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March 30, 2022

Abstract

Background Pediatric patients with cancer are at high risk for severe infections. Delayed diagnosis and treatment increases mortality. Infections can trigger changes of vital signs long before clinical symptoms arise. Continuous recording may detect such changes earlier than discrete measurements. We aimed to assess the feasibility of continuous recording of vital signs by a wearable device (WD) in pediatric patients undergoing chemotherapy for cancer. **Methods** In this prospective, observational single-center pilot study (NCT04134429) pediatric patients undergoing chemotherapy for cancer wore the Everion® WD for 14 days. Results Twenty patients were included (median age, 6 years; range, 2-16). Six patients (predefined feasibility criterion, [?]¹⁵ patients) aged 3-16 years fulfilled the patient specific goal, defined as heart rate recorded with good quality during [?]¹⁸ hours/day on [?]⁷ consecutive days. The quality of heart rate recording was good during 3992 of 6576 (61%) hours studied, poor during 300 (5%) hours, and no data was recorded during 2284 (35%) hours. Eighteen of 20 participants indicated that this WD is acceptable to measure vital signs in children undergoing chemotherapy for cancer. **Conclusion** We found that continuous recording of vital signs by the Everion(r) WD is feasible across a very wide age range in pediatric patients undergoing chemotherapy for cancer. In the configuration studied, however, the predefined feasibility criterion was not fulfilled. This was mainly due to important compliance problems and independent of the WD itself. These results will influence the design of future WD-studies including those aiming to identify patterns predicting fever or infection.

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2020.12.20. Table 1_Feasibility.docx available at <https://authorea.com/users/416218/articles/562190-continuous-recording-of-vital-signs-with-a-wearable-device-in-pediatric-patients-undergoing-chemotherapy-for-cancer-a-feasibility-pilot-study>

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