**Supplementary 2. Study characteristics.**

| | Author, year | Setting | Study Type | Sample Size | Demographics | Haematological or Oncological Medical Condition | Type of Treatment Undergone (if applicable): | Wearable Device | Clinical Measurement Used | Other Non-wearable Device Measurements Used | Facilitators/ Barriers | Accuracy |
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| 1. | Barber et al., 2022 | USA, Prentice Women's Hospital | Observational study | 31 | Mean age: 58 years<br><br>White (54.8%), Black (38.7%), Asian (6.5%) | Oncology: Females with gynaecologic cancer or suspected gynaecologic cancer | Surgery | Fitbit Alta HR | Mean daily HR, total steps taken, and minutes spent in active, sedentary, or light activity | PROs questionnaire: physical function, sleep disturbance, anxiety, fatigue, and pain intensity | Overall wear time for the cohort during the 28-day post-operative period was 83.8%.<br><br>>80% of patients able to adhere to the prespecified definitions of regular use of PROs and wearing of the accelerometer device. (Adherence for an individual patient was defined as completing ≥75% of given PROs, and for Fitbit, wearing the device for ≥16 days during the 28-day post-operative period) | AUC: 0.75 (95% confidence interval: 0.67 to 0.81) |
| 2. | Buchan et al., 2022 | Canada, The Ottawa Hospital | Observational study | 81 | Median age: 53 years | Haematology:<br>-Multiple myeloma<br>-Non-Hodgkin lymphoma<br>-Acute leukaemia<br>-Myelofibrosis<br>-Aplastic anaemia<br>-Hodgkin lymphoma<br>-Autoimmune diseases (Crohn's disease, Sclerosing Cholangitis, Multiple Sclerosis) | Undergoing either allogeneic or autologous HCT | Zephyr BioPatch or BioHarness | 8 measures of HRV: average R-R duration, Poincare SD2 (related to the SD of the heart rate interval time series), power in the high-frequency band, DFA alpha first exponent, DFA area under the curve, Hjorth's complexity parameter, Shannon entropy, and cardiac vagal index (derived from the Poincare plot) | Laboratory biomarker data: C-reactive protein, procalcitonin, soluble CD163, IL-7, soluble TREM-1, IL-1b, IL-6, IL-8, and TNFα.<br><br>Machine learning methodology selected IL-6, IL-7, and TNFα. IL-6 is thought to be a useful early marker of infection and risk for death | The combined biomarker and HRV model increases the likelihood of diagnosing patients at least 24 hours before the onset of infection compared with HRV monitoring alone.<br><br>Many patients reported intolerance based on discomfort with and skin irritation from the devices. | (Without laboratory biomarker data):<br>AUROC: 0.66<br>Specificity: 0.88<br>Sensitivity: 0.28<br><br>(With laboratory biomarker data):<br>AUROC: 0.87<br>Specificity: 0.86<br>Sensitivity: 0.68 |
| 3. | Dambrosio et al., 2018 | USA, did not | Comparative study | 16 | Median age: 58 | Haematology - Multiple | High dose chemothera | TempTraq | Temperature | N/A | All patients were able to self-wear the patch | AUC of binary temperature skin patch in |

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| | | specify hospital | | | years | myeloma<br>- Acute myeloid leukaemia | py or stem-cell transplant | | | | through the hospital admission and the majority reported it was comfortable to wear and are interested in wearing it in future admissions or at discharge.<br><br>All except one patient found the patch uncomfortable, irritates the skin and wore it every day in the hospital<br><br>3 patients TempTraq fell off before it was due for change | all four time intervals was significantly higher than SOC; 0-30 mins: AUC: 0.766 (CI: 0.708-0.824; P<0 .001);<br>30mins-1 hour AUC: 0.755 (CI: 0.701-0.809, P<0.001);<br>1-2 hour AUC: 0.718 (CI: 0.663-0.773, P<0.001);<br>2-4 hour AUC: 0.702 (CI: 0.646- 0.757, P<0.001) |
| 4. | Flora et al., 2021 | USA, did not specify hospital | Prospective observational study | 62 | (n=39) HCT;<br>(n=23) CAR-T therapy | Both Haematology & Oncology | HCT or CAR-T therapy | TempTraq | Temperature | N/A | Detected 89% of fevers a median 5.5 hours earlier | Detected 89% of fevers a median 5.5 hours earlier |
| 5. | Jacobsen et al., 2022 | Germany, University Hospital Dusseldorf | Observational study | 79 | (n=54 inpatient, n=25 outpatient) | Haematology:<br>Haematologic malignancy<br>-acute leukaemia (ALL and AML)<br>- MDS and MPN (PMF and CML) | Chemotherapy alone or in combination with HCT | Everion | HR, temperature, RR, oxygen saturation, blood pressure wave and physical activity | Symptom-related patient-reported outcomes | Adherence of 83.0% for the patients in the inpatient cohort and of 89.6% in outpatient cohort.<br><br>19 inpatient patients and 3 outpatient patients dropped out due to discomfort, continuous blood pressure measurements was stressful and daily 90 mins charging was regarded as too cumbersome.<br><br>The internal data storage capacity of the wearable required a high trial visit frequency for data downloading.<br><br>Frequency and intensity of symptoms is higher in inpatient cohort. | N/A |

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| | | | | | | | | | | | (>10 hours of use per day as a marker for adherence)<br><br>High frequency of trial visits might have positively contributed to the adherence.<br><br>Adherence to wearing the accelerometer device was higher than completion of PROs. | |
| 6. | Jacobsen et al., 2023 | Germany, University Hospital Duesseldorf | Observational study | 79 | (n=54 inpatient, n=25 outpatient) | Haematology:<br>Hematologic malignancy<br>-acute leukaemia (ALL and AML)<br>-MDS and MPN (PMF and CML) | Chemotherapy alone or in combination with haematopoietic stem-cell transplantation | Everion | Heart rate, temperature, respiratory rate, oxygen saturation, blood pressure wave and physical activity | NIL | Prediction of infectious SCC was possible up to 2 days before clinical diagnosis | Inpatient cohort: AUROC: 0.91 ± 0.01, sensitivity: 79.7%, specificity: 87.9%,<br><br>Outpatient cohort:<br>AUROC:<br>0.87 ± 0.02, sensitivity: 77.4%, specificity: 81.8% |
| 7. | Johnson et al., 2017 | USA, SCD Day Hospital | Observational study | 20 | Median age: 28 years old | Haematology:<br>Sickle cell anaemia;<br>β-thalassaemia | N/A | Microsoft Band 2 | HR, R-R interval, steps, and galvanic skin response, angular velocity in Y direction, angular velocity in Z direction | Technology Resources to Understand Pain (TRU-Pain) app, which allows patients to record pain and other symptoms throughout their treatment | Overall good accuracy for SVM for regression model which combines both patient reported symptom and wearable data | SVM model<br>Accuracy: 0.682<br>F1 score of mild pain: 0<br>F1 score of moderate pain: 0.537<br>F1 score of severe pain: 0.786<br>Weighted F1 score: 0.663<br><br>SVM for regression model<br>Accuracy: 0.729<br>F1 score of mild pain: 0.286<br>F1 score of moderate pain: 0.675<br>F1 score of severe pain: 0.803<br>Weighted F1 score: 0.728 |
| 8. | Liu et al., 2023 | China, National Taiwan University Hospital. | Prospective observational study | 40 | Median age: 70.5 years | Oncology:<br>Terminal cancer<br>- Lung<br>- Colorectal<br>- Head and neck<br>- Pancreas<br>- Liver | End-of-life care | Garmin VivoSmart 4 | Steps<br>Minimum HR<br>Maximum HR<br>Average HR<br>Resting HR<br>Average stress level<br>Maximum stress level | Clinical Assessment:<br>Consciousness<br>Appetite Urination<br>Oedema<br>Pain score<br>Sleep<br>Drowsiness<br>Nausea<br>Constipation | Worn on average for 77.42% of the total study days<br><br>Most of the caregivers could operate the device well after being instructed. | AUROC: 96%,<br>F1-score: 78.5%,<br>Accuracy: 93%,<br>Specificity: 97%" |

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| | | | | | | - Breast<br>- Prostate | | | Sleep duration<br>Deep sleep duration<br>Light sleep duration<br>Rapid eye movement sleep duration<br>Awake duration<br>SpO2 | Diarrhoea<br>Dyspnoea<br>Fatigue<br>Fever<br>Functional level (using Australia-modified Karnofsky Performance Status)<br>Care phase<br>Pain control change<br><br>basic demographic | Redness and itchiness of the skin on two patients.<br><br>6% did not wear their wearable device until 7 days before their death which suggests that WD become a burden for patients at the end of their lives.<br><br>Adherence rate is based on the number of study days worn throughout the study. | |
| 9. | Oliveira et al., 2021 | Portugal, Public Hospital | Longtitudinal mixed-model | 16 | Mean age: 58.8 years | Oncology: Terminal cancer<br>- Lung<br>- Colorectal<br>- Head and neck<br>- Pancreas<br>- Liver<br>- Breast<br>- Prostate | Chemotherapy | Microsoft Band 2 | HR, RR, skin temperature and galvanic skin response | Functional Assessment of Chronic Illness Therapy (FACT) questionnaire to evaluate HRQoL | Lower HRV can act as a predictor of diseases or adverse events, especially in patients with diagnosed diseases. Wearable devices that can monitor HRV may serve as early warning systems for health issues. | N/A |
| 10. | Rajeeve et al., 2023 | USA | Clinical trial | 14 | N/A | Haematology<br>- relapsed refractory multiple myeloma | CAR-T therapy | Current Health Inc. | Temperature, pulse, respiratory rate and oxygen saturation | N/A | Wearable adherence during overall monitoring period was 71% (range: 50-81), and 88% (range: 69-89) during high-risk period.<br><br>Wearable adherence was the duration patients wore the device over the total monitoring period<br><br>Wearable detected temperature changes at a median of 205 (range: 50-479) mins earlier. | Detect temperature change at a median of 205 minutes earlier. |
| 11. | Shih et al., 2021 | China, Taipei Medical University Teaching Hospital | Observational study | 12 | Mean age: 65.3 years | Oncology:<br>- lung cancer | Chemotherapy or targeted therapy | ViPCare, Gadgletech | HRV | Brief Fatigue Inventory - Taiwan version questionnaire | Sweating on wearing the device might have caused discomfort to some patients. | The total mapping error rate was 3% and that the LF-HF ratio can be considered a fair indicator to evaluate the degree of cancer-related fatigue |

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| 12. | Slade et al., 2021 | NIL | Prospective observational study | 20 | Median age: 65 years | Oncology:<br>- bladder cancer | Radical cystectomy | Garmin Vívofit | HR, steps, and sleep | N/A | Patients had usable data for a median of 59.3% of the time | N/A |
| 13. | Stojancic et al., 2023 | USA, Duke University SCD Day Hospital | Prospective observational study | 20 | Median age: 35.5 | Haematology: -sickle cell disease<br>-vaso-occlusive crises | N/A | Apple Watch | HR, HRV, calories | Pain scores and vital sign variables including blood pressure, pulse, and temperature, as well as demographics including age, SCD genotype, sex, and ethnicity were extracted from the electronic medical records | N/A | Random forest model:<br>AUC: 0.98<br>Accuracy: 84.5%<br>Micro-averaged F1 score: 0.85<br>RMSE: 0.84 |
| 14. | Sugiyama et al., 2021 | Japan, Nagoya City University Hospital | Prospective cohort study | 21 | Median age: 73 | Oncology:<br>- urothelial carcinoma | Short hydration gemcitabine and cisplatin combination therapy (chemotherapy) | Fitbit Charge 2 | HR, steps and sleep | Quality of life scores using a European organisation for research and treatment of cancer quality of life questionnaire.<br>Quality of Life scores using a Medical Outcomes Study 36-item Short Form Health Survey questionnaire | Acceptability and completion rate of heart monitoring by Fitbit was 100%.<br><br>Complaints about the Fitbit being an inconvenience to daily life were non-existent.<br><br>Inflammation of the skin along the length of the wrist in one case | N/A |
| 15. | Tonino et al., 2019 | The Netherlands, Haga Teaching Hospital | Quantitative feasibility study | 12 | 83% were aged 60 years and older | Haematology:<br>-multiple myeloma<br>-myelo-dysplastic syndrome<br>-non-Hodgkin lymphoma | Red blood cell transfusions, intravenous proteasome inhibitor, or an intravenous immunotherapy agent | VitalPatch | N/A | PROs | Three patients experienced skin irritation from the 2nd patch onwards and one because of connection issues<br><br>Unable to bathe with the patch, need to shave chest hair, patients with haematological malignancies are burdened so heavily by their disease and treatment that even relatively small inconveniences were enough to withdraw. | N/A |

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| 16. | Van Der Stam et al., 2023 | The Netherlands, Catharina Hospital Eindhoven | Prospective single centre trial | 103 | N/A | Oncology: -abdomen cancer | Major abdominal cancer surgery | HealthDot | HR and RR | N/A | Sleep disturbance for the measurement of vital parameters by the nursing staff is reduced.<br><br>The wearable patch could detect the same amount of deteriorations, without requiring manual spot check measurements. | AUC: 0.71 (95% CI: 0.66 to 0.77) |
| 17. | Van Der Stam et al., 2022 | The Netherlands, Catharina Hospital Eindhoven | Prospective single centre trial | 34 | Median age: 64 years (n=25, HR analysis, n=21, RR analysis) | Oncology: -abdomen cancer | Major abdominal cancer surgery | HealthDot | HR and RR | N/A | N/A | Clarke error grid analysis showed that 100% of the HR and 99.4% of the 5-min averaged data was clinically acceptable. |
| 18. | Vuong et al., 2022 | USA, SCD Day Hospital or Duke University | Observational study | 19 | Median age: 30 years;<br>All patients were Black or African American | Haematology: -sickle cell disease -vaso-occlusive crises | N/A | Apple Watch | HR, HRV, oxygen saturation and activity (step count) | Self-reported pain scores collected via the Nanpar mobile app and the electronic health records (EHR) | N/A | Micro-averaged accuracy: 0.89, (89%)<br>Micro-averaged F1-score: 0.49,<br>RMSE: 1.64,<br>AUC: 0.83 |

AUC: area under curve; AUROC: area under the receiver operating characteristic curve; ALL: acute lymphoblastic leukemia; AML: acute myeloid leukemia; CAR-T: chimeric antigen receptor T cell; CML: chronic myeloid leukemia; DFA: detrended fluctuation analysis; HCT: hematopoietic cell transplant; HR: heart rate; HRV: heart rate variability; HRQoL: health-related quality of life; LF-HF ratio: low-frequency to high-frequency ratio; MDS: myelodysplastic syndromes; MPN: myeloproliferative neoplasms; N/A: not applicable; PMF: primary myelofibrosis; PRO: patient reported outcomes; RMSE: root mean square error; RR: respiratory rate; SCC: squamous cell carcinoma; SCD genotype: sickle cell disease genotype; SVM: support vector machine; SCD Day Hospital; sickle cell disease day hospital