

Tay N¹, Popat S¹, Dadhania S^{1,2}, Fidyk C¹, Patel R¹, Davies GSL³

¹Vinehealth Digital Limited, London, UK; ²Imperial College London, London, UK; ³Cromwell Hospital, London, UK

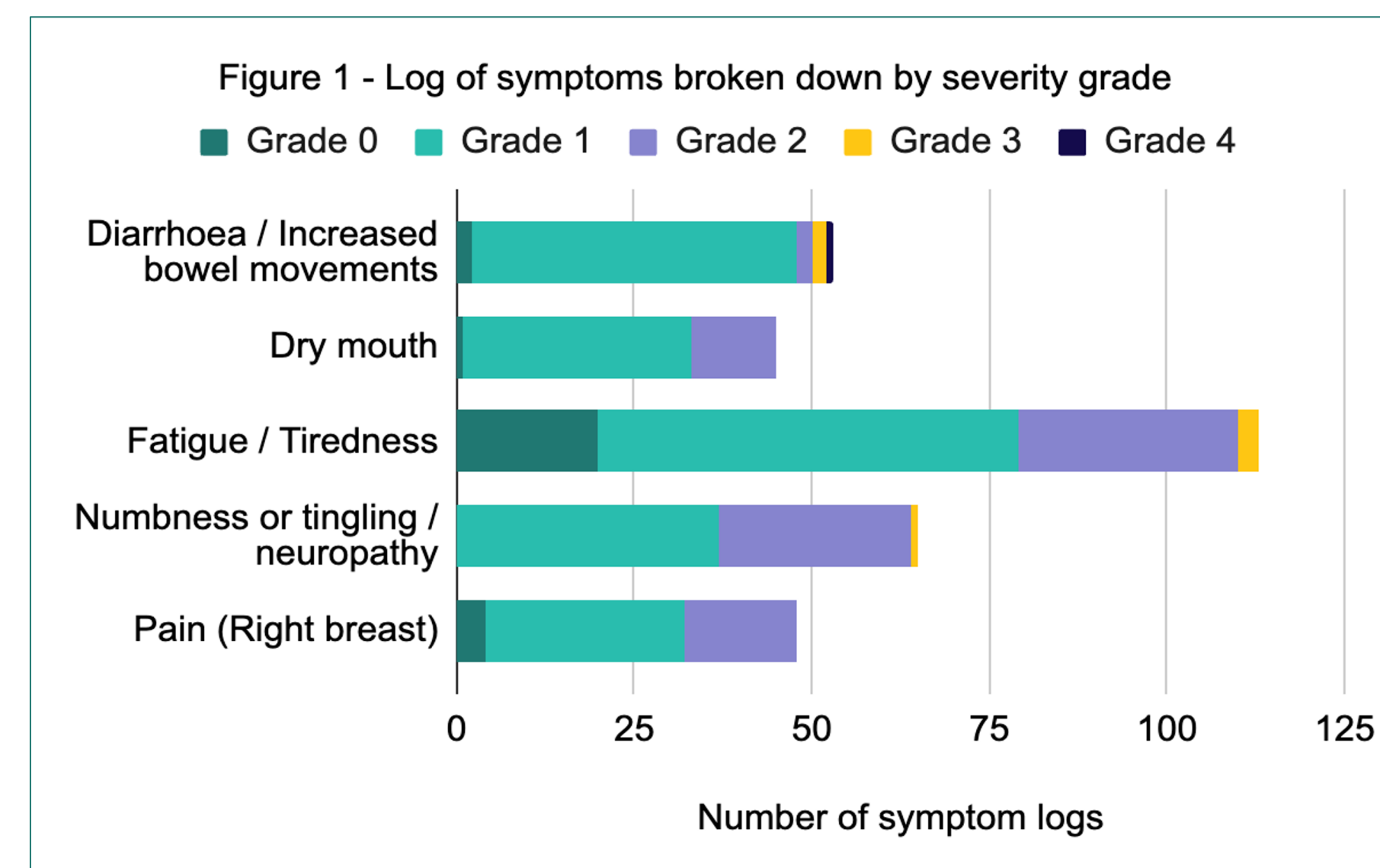
BACKGROUND: The benefits of patient-reported outcomes measures (PROMs) to guide patient care during cancer treatment is well-established¹. PROMs refers to questionnaires/instruments used to report patient-reported outcomes (PROs), to assess patients' experiences, such as symptom burden, functional status and psychological and emotional well-being². Whilst historically collected via paper, there has been increased interest in collecting PROMs electronically due to advances in technology, patient preference and acceptability, lower costs and better response rates³.

OBJECTIVES: The pilot study aimed to evaluate PROMs completion rates and operational efficiencies using Vinehealth, a novel digital oncology platform, in an outpatient breast cancer clinic. The study also aimed to assess the possibility of identifying grade 3 and 4 symptoms that could act as early warning signs of cancer-related treatment complications for remote intervention.

METHODS: A single-centre pilot was conducted at Cromwell Hospital, UK (owned by Bupa) from September-December 2022. Newly diagnosed breast cancer patients undergoing surgery or neoadjuvant chemotherapy were invited to take part in the study. Patients were asked to download the Vinehealth Cancer Companion app and complete PROMs (EQ-5D-5L and EORTC QLQ-C30) at baseline, 6 weeks and 3 months. EORTC QLQ-C30 is frequently used to measure quality of life in cancer patients⁴ while EQ-5D-5L measures and evaluates patients' general health status⁵.

Patients were also encouraged to monitor and record the following key symptoms within the app: pain, fatigue, low mood/depression, changes in libido and sexual function, concentration problems, reduced appetite, nausea/vomiting, constipation/diarrhoea, numbness/tingling, hair loss.

RESULTS: A total of 22 patients provided informed consent to participate in the pilot and downloaded the Vinehealth app. 72.7% (N=16) completed both PROMs (EQ-5D-5L and EORTC QLQ-C30) at least once, with 13 (81.3%) completing baseline PROMs per protocol. 3 further patients completed PROMs after baseline collection following automated Vinehealth reminders. In line with literature, electronic PROMs response rates were observed to be higher than existing paper-based PROM response rates of 7% at Cromwell Hospital.



In addition, and as shown in Figure 1, a total of 889 symptoms were logged. Fatigue (113) was most recorded, followed by numbness/tingling (65), diarrhoea/increased bowel movements (53), pain: right breast (48) and dry mouth (45). Of these symptoms, 11 symptom logs were recorded as grade 3 or 4, which would indicate potential need for clinical attention.

An independent analysis conducted by Cromwell Hospital estimated that paper-based PROMs cost the hospital approximately £63 per patient. This included resources required for questionnaire distribution, chasing completions and manual data entry from the paper questionnaire into an electronic system. Comparatively, once licensed, delivery of digital PROMs and symptom tracking via Vinehealth would be virtually free.

CONCLUSIONS: This study demonstrates digital PROMs collection drastically improves patient response rates and could be a much more cost-effective means of regular PROMs collecting in routine oncology clinical care settings. High levels of symptom logging shows effective patient engagement with Vinehealth, providing potential for a rapid access escalation pathway due to early warning signs of disease- or treatment-associated complications. Additional investigation is required to determine whether this translates into further cost savings from reduced emergency department visits and hospital admissions through early clinical intervention. These results will inform wider implementation across other tumour types within Cromwell Hospital.

1. Di Maio M, Basch E, Denis F, et al. The role of patient-reported outcome measures in the continuum of cancer clinical care: ESMO Clinical Practice Guideline. *Ann Oncol.* 2022;33(9):878-892. doi:10.1016/j.annonc.2022.04.007
2. Weldring T, Smith SM. Patient-Reported Outcomes (PROs) and Patient-Reported Outcome Measures (PROMs). *Health Serv Insights.* 2013;6:61-68. Published 2013 Aug 4. doi:10.4137/HSI.S11093
3. Meirte J, Helleman N, Anthonissen M, et al. Benefits and Disadvantages of Electronic Patient-reported Outcome Measures: Systematic Review. *JMIR Perioper Med.* 2020;3(1):e15588. Published 2020 Apr 3. doi:10.2196/15588
4. Aaronson NK, Ahmedzai S, Bergman B, et al. The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst.* 1993;85(5):365-376. doi:10.1093/jnci/85.5.365
5. Balestroni G, Bertolotti G. L'EuroQol-5D (EQ-5D): uno strumento per la misura della qualità della vita [EuroQol-5D (EQ-5D): an instrument for measuring quality of life]. *Monaldi Arch Chest Dis.* 2012;78(3):155-159. doi:10.4081/monaldi.2012.121

