



Health information technologies and stressors : how to measure and eliminate them

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Background Hospital personnel's daily tasks are regularly interrupted. Unexpected breaks in work patterns act as supplementary cognitive burdens to health workers (hence the term **stressors**) and can lead to errors because they break up the logical flow of clinical tasks.

Purpose This study aimed to examine whether the introduction of a Health Information Technology (HIT) (CytoAdmin - a scanning system for matching patients to their chemotherapy treatment protocols) into a cancer outpatient unit had any immediate influence **on stressors**, with the broader aim of reducing their types and frequency.

Materials and Methods Based on techniques drawn from the field of Human Factors and Ergonomics (HF&E)¹, we established a protocol for carrying out ergonomic evaluation and measuring **stressors**. The System Engineering Initiative for Patient Safety model was our guiding principle ². The protocol covered all tasks in the unit and included field observations, listing **stressors** (number, type) observed during the introduction of the HIT, and process redesign methodologies.

Results During the first 6 days of CytoAdmin's introduction, we carried out 31½ hours of observation for **stressors** and identified 89 different types (**2.7 stressors /hour**)

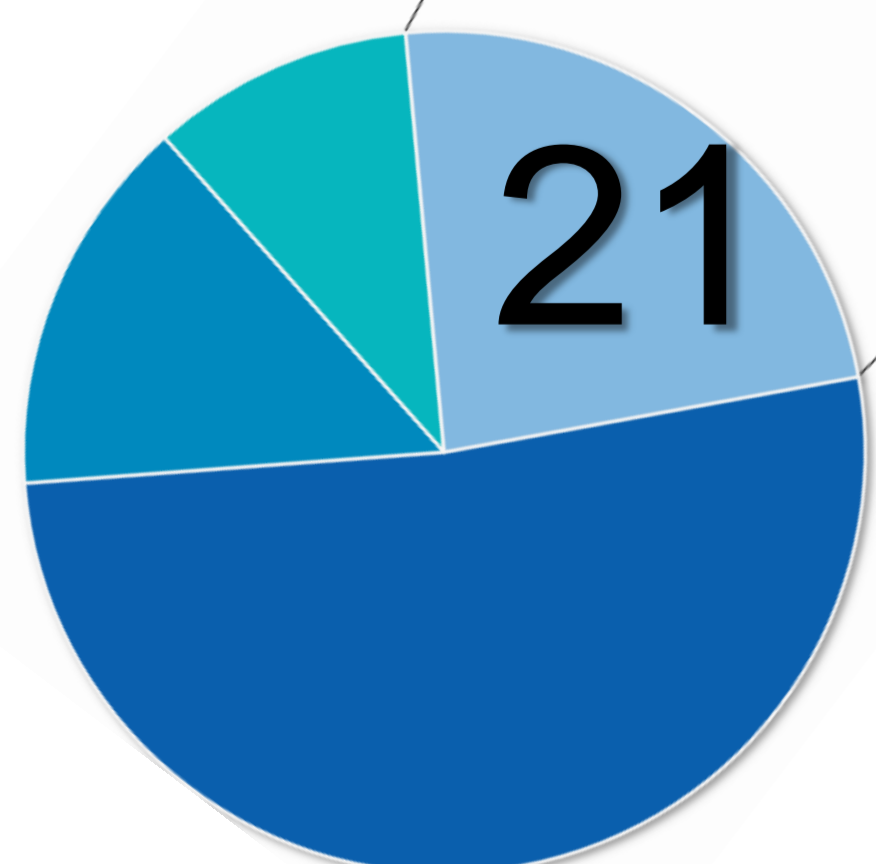
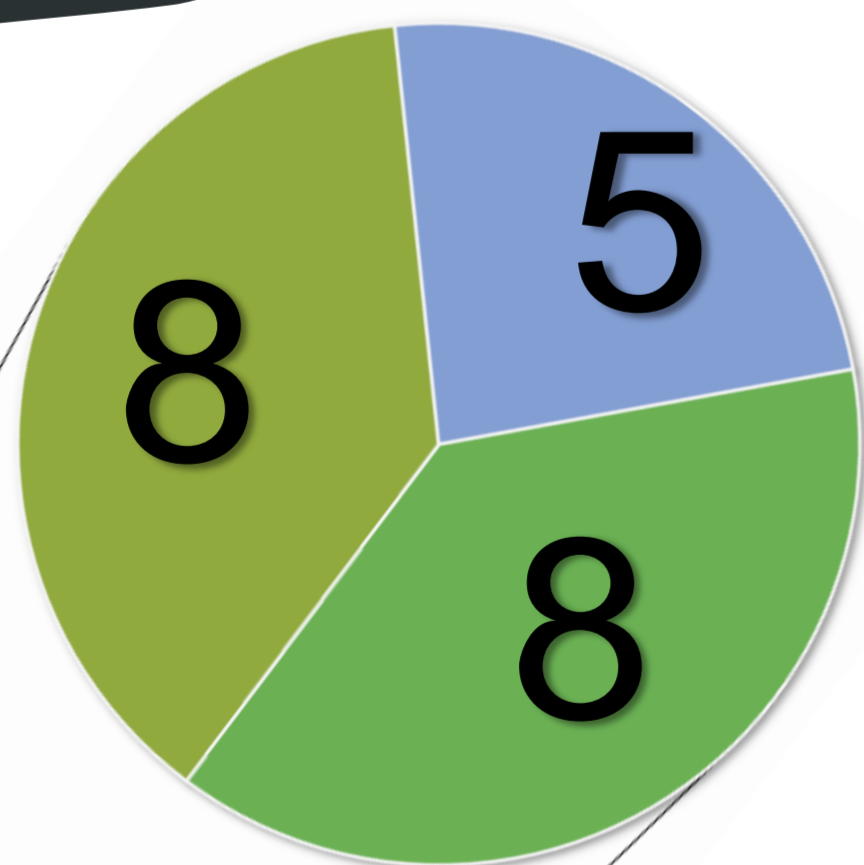
The HIT itself generated **21 new stressors** (24% of total)

Technical hardware problems : 5x

Insufficient number of computers needed to complete tasks : 8x

Inclusion of scanning in a well-established daily care routine : 8x

Other **major stressors** were telephone calls (13 types of stressors, 15%), followed by consulting a physician (9 types, 10%)



Conclusions The introduction of this HIT increased the number of **stressors** by creating new ones. The HF&E system developed was efficient at detecting **new stressors**, redesigning the process and eliminating them. Although these methodologies are time-consuming, ergonomic evaluations are essential for the **satisfactory and safe use** of a newly introduced HIT.

Ergonomic redesign of workflows allowed us to **neutralize all new stressors**.



¹ Carayon P. (Editor) Handbook of Human Factors and Ergonomics in Health Care and Patient Safety, 2nd edition, Lawrence Erlbaum Associates, Hillsdale, NJ, 2012.

² Carayon P, et al. Work system design for patient safety: The SEIPS model. Qual Saf Health Care 2006;15(1):50-58