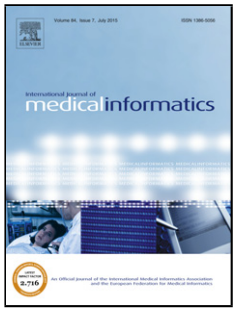

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Identifying and Eliminating Inefficiencies in Information System Usage: A Lean Perspective

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Highlights

- A Lean waste perspective is used to evaluate clinician-EHR workflow mismatches
- 241 workflow impediments were identified and classified according to 8 waste types
- Certain types of waste initiated a series of additional wasteful activities
- Waste also proliferated as a result of mimicked and routinized EHR usage
- Elimination prioritization should be based on impact on safety, quality, delivery and cost

Abstract

Objectives: Mismatches frequently occur between information system (IS) dictated workflows and actual workflows of IS users. The resulting impeded workflows negatively influence the efficiency with which goods or services are produced and delivered to customers. Within a healthcare context, impeded workflows can additionally have a negative impact on the safety and effectiveness of care delivered to patients.

Methods: This study evaluates the impact of an electronic health record system of a large university hospital on workflows of healthcare professionals from a lean management waste perspective. Workflow mismatches were identified from direct observations and follow-up semi-structured interviews with physicians and nurses and assessed in terms of waste generated.

Results: In total, 241 manifestations of waste were identified and classified according to 8 types of waste. Furthermore, noteworthy relationships among the identified manifestations of waste were found. These include differences in frequency per type of waste, certain types of waste having a cascading effect, and waste proliferating as a result of mimicked and routinized behavior.

Conclusions: The knowledge obtained from this study can support (re)design of IS to better match workflows which may subsequently lead to more safe, effective and efficient patient care.

Keywords: case study, electronic health records, healthcare, inefficiency, information technology, information system, lean, usability, waste