

Summary of Best Papers Selected for the 2018 Edition of the IMIA Yearbook, Section Human Factors and Organizational Issues

Ancker JS, Edwards A, Nosal S, Hauser D, Mauer E, Kaushal R., with the HITEC Investigators

Effects of workload, work complexity, and repeated alerts on alert fatigue in a clinical decision support system

BMC Med Inform Decis Mak 2017 Apr 10;17(1):36

Although alert fatigue is blamed for high override rates in contemporary clinical decision support systems, the concept of alert fatigue is poorly defined. This study tests two possible alert fatigue mechanisms: (i) *cognitive overload* associated with a high amount of work, complexity of work, and efforts distinguishing informative from uninformative alerts, and (ii) *desensitization* from repeated exposure to the same alert over time. The results show that clinicians became less likely to accept alerts as they received a lot of them, particularly in the case of repeated alerts. There was no evidence of an effect of workload per se, or of desensitization over time for a newly deployed alert.

Blijleven V, Koelemeijer K, Wetzels M, Jaspers M

Workarounds emerging from electronic health record system usage: consequences for patient safety, effectiveness of care, and efficiency of care

JMIR Hum Factors 2017 Oct 5;4(4):e27

Health care providers resort to informal temporary practices known as workarounds

for handling exceptions to normal workflow unintentionally imposed by electronic health record systems (EHRs). Research on the scope and impact of EHR workarounds on patient care processes is scarce. Based on a large case study, the authors present an overview of 15 bottom-up identified rationales for EHR workarounds and give a definition for each rationale. In addition, for the most prominent workarounds, their scope and impact on patient safety, effectiveness of care, and efficiency of care are discussed from a sociotechnical perspective using the Systems Engineering Initiative for Patient Safety (SEIPS) framework.

Cresswell KM, Mozaffar H, Lee L, Williams R, Sheikh A

Safety risks associated with the lack of integration and interfacing of hospital health information technologies: a qualitative study of hospital electronic prescribing systems in England

BMJ Qual Saf 2017 Jul;26(7):530-41

Mitigating safety risks in health information technology is highly dependent on the effective integration of information within systems and/or interoperability to allow information exchange across systems. The paper explores the social and technical challenges relating to integration and interfacing experienced by early adopter hospitals of standalone and hospital-wide multi-modular integrated electronic prescribing systems. Based on a longitudinal qualitative study, the results highlight that while multi-modular systems offer somewhat better usability, standalone systems provide greater flexibility and opportunity for innovation, particularly in relation to interoperability with external systems and to customizability to the needs of different user groups.

Dufendach KR, Koch S, Unertl KM, Lehmann CU

A randomized trial comparing classical participatory design to VandAID, an interactive crowdsourcing platform to facilitate user-centered design

Methods Inf Med 2017 Oct 26;56(5):344-9

Early involvement of stakeholders in the design of medical software is particularly important due to the need to incorporate complex knowledge and actions associated with clinical work. Standard user-centered design (UCD) methods may limit user involvement to a small number of individuals due to the significant time investment from designers and end users. VandAID, a new web-based crowdsourcing platform, was tested in a randomized trial. The results show that VandAID can simultaneously involve multiple users in UCD and provides means of obtaining design feedback remotely.

Luna DR, Rizzato Lede DA, Otero CM, Risk MR, González Bernaldo de Quirós F

User-centered design improves the usability of drug-drug interaction alerts: experimental comparison of interfaces

J Biomed Inform 2017 Feb;66:204-13

Clinical Decision Support Systems can alert health professionals about drug-drug interactions when they prescribe medications. But the alert override rate of this kind of system is very high. This paper describes the methodology of a User-Centered Design (UCD) that goes beyond UCD and cooperative design approaches to include end users as active participants in the design and decision-making. The authors tested a crossover method for scientifically compare the usability of an interface designed with standard method with an interface designed with a participatory UCD in terms of efficiency, effectiveness, and user satisfaction.