

2022 National Work Health and Safety Colloquium

Title

Guidelines for Safe Collaborative Robot Design and Implementation

Abstract (max. 250 words)

Collaborative robots (cobots) are designed to work with humans on shared tasks in a shared workspace. Unlike conventional robots, cobots are comparably lower cost, lightweight, and are more intuitive to program. These features present an accessible entry point to automation for small and medium-sized enterprises. However, the increasing use of cobots raises new work, health, and safety (WHS) concerns.

Based on systematic literature reviews combined with interview studies, design-led workshops and citizen science, this research developed *Guidelines for Safe Collaborative Robot Design and Implementation*. To ensure practice relevance, we utilised an iterative, action research-based methodology to evaluate and improve the guidelines. The purpose of the guidelines is to have a practical point of reference to ensure the safe adoption and use of cobot systems across different industries.

The literature reviews and interview studies highlighted the confusion around what a cobot is and how it can have a critical impact on safety. Therefore, the introductory parts of the *Guidelines for Safe Collaborative Robot Design and Implementation* focus on clarifying what a cobot is, as well as the different interaction modes humans may have with cobots, and how these can be conducted safely.

It could also be observed that the focus of current standards and literature was on the physical harm that cobots may inflict, much less so on the psychological and ethical impact. Thus, the *Guidelines for Safe Collaborative Robot Design and Implementation* address all types of harm, and suggest measures to reduce the associated risks accordingly.