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**Citation:** Santomauro, C., Powell, M., Davis, C., Liu, D., Aitken, L. M. & Sanderson, P. (2018). Interruptions to intensive care nurses lead to clinical errors. *Australian Critical Care*, 31(2), 125. doi: 10.1016/j.aucc.2017.12.038

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**Link to published version:** <https://doi.org/10.1016/j.aucc.2017.12.038>

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## **Interruptions to intensive care nurses lead to clinical errors**

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**Introduction:** Interruptions occur frequently in the Intensive Care Unit (ICU), and are associated with clinical errors. However, a potential causal connection between workplace interruptions and medical errors has not been investigated. It is important to know if a causal link exists before designing and implementing interventions to reduce interruption rates.

**Objectives:** The purpose of this study was to test whether nurses who receive a high number of interruptions commit more clinical errors than nurses who receive a low number of interruptions.

**Methods:** We carried out a controlled trial in a high-fidelity ICU simulator at a tertiary Queensland hospital. ICU nurses (N = 70) prepared and administered intravenous medications for a simulated patient manikin. Participants received 3 or 12 interruptions and were allocated to either condition in an alternating fashion. Interruptions were relevant to the scenario and delivered via either a confederate playing an Access Nurse or from patient, bedside phone, and equipment alarms. Video recordings were analysed for clinical errors, which were deviations from the medication order or procedure that resulted in the patient directly receiving a medication inconsistent with what was prescribed.

**Results:** A Poisson regression revealed that nurses who received 12 interruptions (M = 2.74, 95% CIs [2.19, 3.29]) committed clinical errors 2.00 times (95% CIs [1.41, 2.83]) more frequently than nurses who received 3 interruptions (M = 1.37, 95% CIs [0.99, 1.75]),  $p < 0.001$ .

**Conclusions:** This study was the first to directly test the causal connection between interruptions and errors in the ICU. Nurses who received a high number of interruptions committed twice the number of clinical errors as nurses who received a low number of interruptions. Interventions designed to reduce the frequency of interruptions may be effective at reducing clinical errors, but further research should investigate potential unintended consequences of eliminating interruptions in the ICU.