Technologies
Automated technologies associated with the dispensing and administration of medication in hospital settings. Including automated medication dispensing devices, bar-coding verification systems for medication dispensing and administration, and electronic medication administration records.

Issue
Patient safety has become a key issue in this country. Medication distribution processes in hospitals involve multiple steps and personnel, which can contribute to errors and result in unintended adverse events. Technologies intended to reduce medication dispensing and administration errors can contribute to hospital-based patient safety strategies.

Methods
To assess the impact of automated technologies on medication errors, a systematic review of clinical and economic literature was performed. Mathematical modelling was used to compare the cost-effectiveness of manual (with medication cassettes) to unprofiled and profiled ward-based automated drug distribution systems.

Results
Limited quality data from available literature indicates the potential to reduce medication errors in some hospital settings. In particular, the use of bar-coding for medication dispensing and administration systems, and the simultaneous use of technologies and ward-based automatic dispensing devices could reduce the risk of medication errors in hospitals. There is insufficient evidence to reliably estimate the impact of implementing pharmacy-based automatic dispensing devices or predict how automation affects the rate of adverse drug events, near misses, morbidity, and mortality.

Ward-based automated dispensing devices in medical-surgical patient care units can reduce costs and error rates. Reliable estimates of the economic impact of other technologies could not be made due to lack of evidence.

Implications for Decision-Making
- **Bar-coding systems demonstrated reduced risk of errors.** Studies in hospital settings using bar code medication dispensing and administration systems noted decreased risk of medication errors.
- **Ward-based automatic dispensing devices may represent good value for money.** In medical and surgical patient care units, the use of ward-based automatic dispensing devices has the potential to reduce net costs while reducing the risk of error rates. Net costs in intensive care unit (ICU) settings are increased, due to large capital expenditure to cover a smaller number of patients and uncertainty over clinical impact in ICU settings.
- **Lack of persuasive evidence suggests the need for more robust studies.** Available studies used observational design; many were uncontrolled and un-blinded. Research with better internal validity and statistical reporting is needed to better estimate the effect of technologies on patient safety.

This summary is based on a comprehensive health technology assessment available from CADTH’s website (www.cadth.ca): Perras C, Jacobs P, Boucher M, Murphy G, Hope J, Lefebvre P, McGill S, Morrison A. Technologies to Reduce Errors in Dispensing and Administration of Medication in Hospitals: Clinical and Economic Analyses [Technology report number 121].