

# Development and validation of clinical rules to address risk prescriptions



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## Conclusion and relevance

In summary, the clinical rules generated a large number of alerts for risk prescriptions in the majority of hospital in-patients over 65 years. The risk prescriptions were very likely to remain after two days and a quarter of them were clinically relevant.

## Background and importance

The hospital is planning to implement a closed loop medication system, including dose dispensed medication, which legally requires pharmaceutical validation. An advanced system for pharmaceutical validation, built on clinical rules based on real-time data on patient's medication, lab data, diagnosis, is planned to be developed and implemented at the hospital. Pharmacists will be first recipients of the alerts, only forwarding relevant alerts to the physician. The research project is called System Assisted Pharmaceutical VALidation (SAPVAL). A challenge is to develop well-defined clinical rules that do not miss relevant risks or result in alert fatigue.

## Materials and methods

Through a literature search and consultations with local experts, a set of clinical rules was determined. A retrospective cross-sectional study was performed to validate the clinical rules on a study population of 500 patients 65 years and older. The clinical rules were applied on patient data from the electronic health records the day after admission to the hospital, to determine the prevalence of risk prescriptions identified by the clinical rules. It was investigated whether the risks remained after two days. From the total generated alerts, 10% were randomly selected and assessed for clinical relevance by an experienced clinician.

## Aim and objectives

The aim of the study was to determine a set of clinical rules and then apply the rules to in-patient data to determine the prevalence and clinical significance of the generated alerts. The rules will form the base in a future system for pharmaceutical validation of in-patients' prescriptions at Uppsala University Hospital.

## Results

A number of 62 clinical rules were defined and applied. Of these, 40 rules generated one or more alerts. The clinical rules generated 893 alerts in 338 (68%) out of 500 patients, and 84% of alerts remained two days after the patient was admitted to hospital or at discharge. From the randomly selected alerts 24% were deemed clinically relevant.



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