

# Developing PHarmacie-4 - A simple risk tool to identify patients at risk of medication-related problems post-discharge.

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**Background** A hospital outreach medication review service established in 2015, in Western Australia supports complex patients at risk of medication-related problems in the early post-discharge period. The non-validated Patient Risk Stratification Instrument (PRSI) was used to identify and refer high-risk patients. The PRSI tool was time-consuming to complete and a barrier to referral.

**Purpose** Our aim was to develop a simple, validated tool, easily applied by pharmacists at the bedside to assist in identifying and referring patients at risk of readmission through medication misadventure.

**Method** Candidate risk variables were identified through a systematic literature review and a survey of pharmacists. Using linear regression analysis, variables were studied in a complex patient cohort, to determine if they were associated with increased healthcare utilisation -a composite endpoint including the total number of inpatient presentations, emergency department presentations, and days spent in hospital in the previous year. Final predictor variables were refined to include clinically important or statistically significant risk factors in a high-risk cohort, and variables easily accessible at the bedside.

**Findings** Of twenty two initial risk variables identified, ten met defined criteria to form PHarmacie-4. Either Polypharmacy or High Risk Drug(s) was considered essential to ensure a 'medicines focus'. A score of 4 or more indicated higher risk. Variables included; Age > 65 years, Rural/remote residence, Mental health or cognitive impairment, lives Alone, Chronic Comorbidities >3 or Extended length-of-stay > 5 days. A cohort of high-risk patients (n=180) and a comparator group (n=24) were studied retrospectively. The PHarmacie-4 tool correlated strongly with PSRI (confusion matrix score of 88.89%). There was a positive relationship between the PHarmacie-4 stratification of patients as high-risk and the incidence of hospital readmission within 90-days post-discharge in the subject group ( $\kappa = 0.95$ ,  $p=0.047$ ).

**Conclusion** With PHarmacie-4 effectively identifying patients at risk of medication-related readmission, internal validation studies have now been completed and a randomised controlled trial is now underway.