Table C-4. Overview of systematic reviews for medication errors and adverse drug events

| **Title, Author, Year of publication**  **ROBIS score** | **Population, Setting, Search Dates, Included study type/counts** | **Interventions Included** | **Outcomes Assessed** | **Conclusions Reported in the Review** |
| --- | --- | --- | --- | --- |
| Interventions for preventing delirium in older people in institutional long-term care (Clegg et al. 2014)26  ROBIS: Low | Population: Older patients  Setting: Long-term care  Search dates: Up to April 2013  Included study type/ counts: 2 cluster RCTs | 1.Hydration-based interventionIntervention to assess hydration needs and provide adequate fluids  2.Computer program which searched prescriptions for medications that might increase the  chance of developing delirium | Prevalence, incidence, and severity of delirium | Very limited evidence (only 2 studies) Computerized system to identify medications and trigger pharmacist review reported a reduction in delirium incidence in a single study. A small hydration study was negative. |
| Interventions to improve the appropriate use of polypharmacy for older people  (Patterson et al. 2014)27  ROBIS: Low | Population: Adults > age 65 with more than one long-term medical condition  Setting: Any  Search dates: Up to Nov 2013  Included study type/counts: 12 RCTs | Interventions to improve polypharmacy, including professional/educational, organizational, financial and regulatory | Primary Outcomes: Appropriateness of prescribed medications; Prevalence of appropriate medication; Hospital admissions  Secondary outcomes: Medication-related problems (adverse drug reactions, drug-drug interactions, medication errors); Medication adherence; Quality of life | Interventions helped reduce inappropriate prescribing, but no evidence of corresponding clinical improvement |
| Medication reviews for nursing home residents to reduce mortality and hospitalization: systematic review and meta-analysis  (Wallerstedt et al. 2014)28  ROBIS: Low | Population: Nursing home residents  Setting: Nursing home  Search dates: January 1990 to June 2012  Included study type/ counts: 7 RCTs; 5 non-RCTs | Medication reviews conducted by pharmacists, physicians, geriatricians and geriatric nurses, or multidisciplinary teams | Mortality; Hospitalization | Medication reviews for nursing home residents were not effective in decreasing mortality or hospitalization |
| Interventions to optimise prescribing for older people in care homes  (Alldred et al. 2013)29  ROBIS: Low | Population: Older patients in care homes  Setting: Care homes  Search dates: 1966 to November 2012  Included study type/ counts: 2 RCTs; 6 Cluster RCTs | 1. Professional interventions (educational programs aimed at prescribers)  2. Organizational interventions (medication review  services or specialist clinics, case conferencing, information and  communication technology interventions) | Adverse drug events; Hospital admissions; Mortality; Quality of life; Medication related problems; Medication appropriateness; Medicine costs | No evidence of effect of interventions on adverse drug effects, hospital admissions, and mortality. |
| The effect of interventions to reduce potentially inappropriate antibiotic prescribing in long-term care facilities: a systematic review of randomised controlled trials  (Fleming et al. 2013)30  ROBIS: Low | Population: Older patients in care homes  Setting: Care homes  Search dates: Up to August 2012  Included study type/ counts: 4 RCTs | 1.Educational material and  sessions for physicians and nurses  2.Prescribing feedback | Rate or proportion of antibiotics prescribed; Rate of antibiotics prescribed that were in accordance with recommended guidelines. | Education for medical staff may improve antibiotic prescribing but evidence was limited in this review. |
| Medication reconciliation during the transition to and from long-term care settings: a systematic review (Chhabra et al. 2012)31  ROBIS: Low | Population: Older patients transferred to and from long-term care settings  Setting: Long-term care  Search dates: 1950 to August 2010  Included study type/ counts: 4 quasi experimental  design; 2 RCTs; 1 observational study | Medication reconciliation interventions | Drug discrepancies; Discrepancy related ADEs; Potential drug related Problems  Within 60 days of  Discharge (Mortality, Rehospitalizations, Ambulatory clinic Visits, ED visit, Length of stay, Unspecified Medications, Medication errors, Quality of prescribing, Falls, Worsening mobility, Worsening behaviors, Increased confusion, Worsening pain) | All studies reported improvement associated with the intervention. However, methodological flaws limited the ability to draw conclusions about the effectiveness of these interventions. |
| Effect of interventions to reduce potentially inappropriate use of drugs in nursing homes: a systematic review of randomised controlled trials (Forsetlund et al. 2011)32  ROBIS: Low | Population: Nursing home patients  Setting: Nursing home  Search dates: Up to April 2010  Included study type/ counts: 20 RCTs | 1.Educational outreach initiatives 2.Educational meetings 3.Educational meetings with at least one additional  intervention 4.Medication review 5.Geriatric assessment and care teams 6.Early psychiatric intervention 7.Activity program interventions for residents | Proportion of residents with at least one fall in the past 12 months; Use of physical restraint; ‘Interactional’ physical restraint (force or pressure in medical examination, treatment or in activities of daily living); Mortality;  Number of admissions to hospital; Number of days alive; Number of falls; Number of patients that fell | Educational interventions, alone or in conjunction with pharmacist review, may reduce inappropriate drug use. Evidence quality is low. |
| Computerised clinical decision support systems to improve medication safety in long-term care homes: a systematic review  (Marasinghe et al. 2015)33  ROBIS: High | Population: Residents of long-term care  Setting: Long-term care homes  Search Dates: Up to 2014  Included study type/counts: 7 studies (5 RCTs; 2 pre-post) | Computerized clinical decision support systems | Medication safety | Five studies reported improved medication safety and 2 found no improvement |
| Studies to reduce unnecessary medication use in frail older adults: a systematic review  (Tjia et al. 2013)34  ROBIS: High | Population: Frail older adults  Setting: Long-term care, nursing homes and hospitals, home care, hospice and community  Search dates: January 1966 to September 2012  Included study type/ counts: 15 RCTs; 4 Non RCTs; 6 Pre-post; 11 Case series | 1. Pharmacist review of drug list and diagnoses and discontinuation processes  2. Academic detailing to physicians  3. Staff education  4. Audit and feedback reports about medication overuse  5. Physician-led medication reviews | Reductions in explicitly defined unnecessary medications; Number of recommendations to discontinue unnecessary medications; Reductions in composite measures of inappropriate medications that include unnecessary medications | Majority of controlled studies reported significant reductions in unnecessary medications with an intervention |
| Interventions to optimise prescribing in care homes: systematic review (Loganathan et al. 2011)35  ROBIS: Unclear | Population: Older patients in long-term care  Setting: Long-term care  Search dates: 1990 to April 2010  Included study type/ counts: 11  cluster RCTs; 2 RCTs; 2 controlled before-after; 1 before-after | 1.Staff education, 2.Multi- disciplinary team meetings 3.Pharmacist medication reviews 4.Computerized clinical decision  support systems | Proportion, number and total drug use; Composite behavioral disorders; Change in percentage of falls | Limited evidence for effectiveness, but education intervention showed the most promise. |
| Interventions to Improve Transitional Care Between Nursing Homes and Hospitals: A Systematic Review  (LaMantia et al. 2010)36  ROBIS: High | Population: Patients aged 65 years or older  Setting: Transitioning between nursing homes and hospitals in either direction  Search dates: Inception to June 2008  Included study type/counts: 1 RCT; 2 pre/post studies; 2 descriptive | Interventions to improve communication of medication lists, including transfer summaries and standardized documentation and medication reconciliation | Appropriate use of medications (by using Medication Appropriateness Index), adverse drug effects | Standardized patient transfer documentation assists in the successful communication of medication lists; pharmacist-developed review of medication lists help identify omitted or indicated medications on patient transfer |

ROBIS=Risk of Bias in Systematic Reviews; RCT=Randomized controlled trial; QOL=Quality of life