SCOTTISH PATIENT SAFETY PROGRAMME

MEDICINES

Medicine or medicine group	Harm (adverse effect or effect of omitted dose(s))	Deterioration (changes that are associated with increased likelihood of harm in that patient)	Interventions to PREVENT deterioration	Interventions to increase RECOGNITION of deterioration	Interventions to improve (structured) RESPONSE to deterioration
Warfarin and other anticoagulants (including Direct Oral Anticoagulants (DOACs), Low Molecular Weight Heparins (LMWH)	**ADR** - Bleeding **Harm from omission** - Thrombosis (Pulmonary embolus, deep vein thrombosis, stroke)	- Sepsis - Heart failure - New medicines - Excess alcohol use - Change in diet - Acute kidney injury (AKI) - (DOACs, LMWH) - Transfer to a different area/team - Acute surgical illness - Anaemia - Thrombocytopaenia - Increased risk of falls	- Education regarding diet and alcohol (e.g. Leaflet) - AKI bundle - Falls bundle	- Advice leaflet re seeking medical advice - Daily INR x 3 when risk factors present - Regular INR -Monitor haemoglobin, platelets and renal function - Monitor medicines reconciliation and drug omissions - Reliable communication of falls risk	- Make appropriate protocols easily accessible - Electronic alerts - Access to haematology advice - Reliable medicines reconciliation - Daily medication chart review, especially of high-risk medicines - Senior oversight of medication plan, prescriptions and results - Build capacity and capability through multidisciplinary and cross-interface approaches
Antihypertensives	**ADR** - AKI - Postural hypotension and falls Hyperkalaemia **Harm from omission** - Hypertensive crises, - Angina (rate-limiting antihypertensives) - Heart failure	**Increased risk of ADR** - Diarrhoea, vomiting Pain treated with NSAIDs (including OTC) Addition of Angiotensin 2 Receptor Antagonist to Angiotensin Cholinesterase Inhibitor (ACEI) - Other interactions (trimethoprim) - Blood loss **Increased risk of omissions** - Dehydration/AKI	- Advice leaflet to avoid NSAIDs - AKI bundle	- Advice leaflet re seeking medical advice, patient education (e.g. PCA(P) 2016) - Structured ward rounds - Structured communication of medicines planning - Identification and review (BP, renal functions) of patients on high risk medicine combinations via prescribing or dispensing reports - Falls bundle - Fluid balance - Appropriate monitoring of BP in all patients	- "Sick day rules" and appropriate processes for advertising these at home - Designing medicines reconciliation to facilitate cessation of nephrotoxic medicines when appropriate - Use of pharmacy technicians to issue cards/counsel patients - Standard IV fluid prescribing policy - Falls assessment - Comprehensive geriatric assessment - De-prescribing when appropriate - AKI bundle
Antiplatelet medicines (incl clopidogrel) and NSAIDs	**ADR** - Bleeding (gastrointestinal (GI), other sites) **Harm from omission** - Thrombosis - Pain - Decreased mobility	- Dyspepsia - Recent increase in dose (e.g. acute coronary syndrome (ACS), gout) - Co-prescription of other anticoagulants and antithrombotics - Stopping proton pump inhibitors (e.g. after diarrhoea) - Medicines stopped during GI bleed may increase risk of ACS/transient ischemic attacks	- Advice to take NSAIDs with meals when appropriate - Advice to patients when to stop NSAIDs (e.g. sick day rules) - Prophylactic gastro-protection in the elderly - Standardised risk assessment for GI bleeding and re-bleeding vs. thrombosis	- Electronic alerts for high risk patients - Early review of symptoms - Monitoring Hb (and e-alerts of falls in Hb) - Education to increase awareness - Patient information leaflet	- Reliable use of appropriate protocols for gastrointestinal and other bleeding - Structured referrals to endoscopy
Paracetamol	**ADR** - Liver damage and death **Harm from omission** - Fever, pain	- Worsening liver function - Lack of oral access leading to IV administration	- Write prescriptions in mg/kg (for paediatric patients) - Staff education	- Ensure patient weight is recorded in all prescription charts - Monitor harms from high-volume medicines (high aggregate harm) - Daily review of prescriptions	- If patient has liver failure, stop all hepatotoxic drugs, including paracetamol - Consider referral to liver team, treatment with acetylcysteine

This table has been developed based on discussions regarding high risk medicines at the 2016 SPSP Conference, intended to support local discussion regarding opportunities for improvement in the context of high risk medicines.

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Hypoglycaemic medicines (oral hypoglycaemic drugs, insulin)	**ADR** - Hypoglycaemia (also coma and myocardial infarction) - Hyperglycaemia **Harm from omission** - Diabetic ketoacidosis - Hyperosmolar hyperglycaemic state - Infection	- Change in medicines - Changes in diet or appetite - Infection - Transfer of medical care	- Professional and patient education on signs and symptoms of hyperglycaemia- - Professional and patient education on signs, symptoms, prevention and management of hypoglycaemia - Advice re medicines and diet, and when to seek medical advice for patients and practitioners - Reduce transfers through many wards. - Access to expert advice and teaching (diabetic specialist nurse / medical staff) - Improve information sharing between care settings/systems (e.g. SCI-diabetes, Trak, GP systems) - Community assessments of medicines use - Healthcare staff to undertake Diabetes think check act elearning modules via learn pro	- Regular blood glucose monitoring and recording for people treated with insulin and oral hypoglycaemic agents - Blood glucose monitoring for people prescribed steroid, enteral or parental nutrition with or without known diabetes - E-alert from labs and point of care (POC) devices. - Education regarding testing of ketones - Improved POC testing. - Patient and practitioner education (e.g. on recognition of signs of hypo and hyperglycaemia) - Healthcare staff to undertake Diabetes think check act elearning modules via learn pro	- Easy access to standardised protocols for managing diabetic emergencies (Diabetic ketoacidsis, hyperosmolar hyperglycaemic state, hypoglycaemia) - Hypo box with treatment algorithms - Healthcare staff to undertake Diabetes think check act elearning modules via learn pro
Gentamicin / Aminoglycosides	**ADR** - Nephrotoxicity - Ototoxicity **Harm from omission** - Severe sepsis - Multiple dose omissions may contribute to patient death	- Acute kidney injury (AKI), also after drug interactions and poor diabetes control - Transfer of care (failure to communicate treatment plan e.g. bloods, duplicate dosing, continuing treatment with gentamicin)	- Planned duration of treatment clearly recorded and communicated - Daily review using standardised gentamicin prescribing tools e.g. chart, calculator - Timely blood tests and interpretation of levels - Education and training on critical meds & need to take steps to avoid missed doses - Reliable use of antimicrobial guidance and Sepsis 6 treatments - Reliable review of prescription charts at ward rounds	- Reliable use of blood tests and gentamicin monitoring - Patient and staff education about ototoxicity - Clear allocation of doctor and nurse responsible for regular review of septic patients - Reliable use and response to early warning scores - Reliable review of prescription charts at ward rounds	- Refer to renal team where appropriate - Stop gentamicin where appropriate - Appropriate treatment for AKI (IV fluids, stop nephrotoxic drugs, etc) - Sampling times for gentamicin shared in ward white boards - Manage sepsis appropriately, use of current sepsis guidance
Anticholinergics in elderly and frail patients	**ADR** - Increased falls - Dementia - Confusion - Urinary retention **Harm from omission** - Uncontrolled pain - Uncontrolled depression	- Pain (treatment with nefopam, amitriptyline) - Depression (treatment with tricyclic antidepressants)	- Polypharmacy review - Non pharmacological treatments for pain and depression	- Increased staff, patient and carer awareness through education	- Stopping anticholinergics - Comprehensive geriatric assessment and management

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Morphine and opioids	**ADR** - Respiratory depression - Dependence - Constipation **Harm from omission** - Uncontrolled pain - Acute withdrawal - Delayed mobilisation and discharge	- Inability to swallow (if on regular oral opioids) - Co-prescription of other sedatives - Obesity &sleep apnoea - Reduced metabolism - Respiratory illnesses increasing risk of hypoxia - Persistent pain (increased risk of addiction?)	- Use of structured acute pain treatment guidelines - Education and tools to advice on dosing/range - Reliable medicines reconciliation - Encourage adding review/end date for opiate prescriptions - GP supervision of chronic opiate prescriptions (not repeat prescribing) - E-alerts, minimise unnecessary long term use - Polypharmacy review	- Structured assessment of sedation - Staff education on risks - Referral to pain team - Reliable recording of NEWS - Use of sedation/pain score	- Safe positioning of patients - Naloxone, structured response to opiate poisoning - Daily review of opiate prescriptions - Appropriate referral to specialist review (e.g. pain team, palliative care, addictions services, etc.)
Benzodiazepines	**ADR** - Oversedation - Falls - Paradoxical agitation - Dependence **Harm from omission** - Severe alcohol withdrawal and other severe agitation, violence, disturbance for other patient - Poor patient experience - Insomnia and agitation	- Co-prescription of other sedatives - Obesity &sleep apnoea - Reduced metabolism - Respiratory illnesses increasing risk of hypoxia	- Reliable use of appropriate protocols for management of acute alcohol withdrawal and agitation - Polypharmacy review - Avoiding long term prescribing	- Structured assessment of sedation - Increased awareness of risk - Referral to Alcohol liaison services - Reliable recording of NEWS - Use of sedation scores	- Safe positioning of patients - Structured response to deterioration in NEWS - Appropriate referral to specialist team (e.g. intensive care, addictions services etc.)
Lithium	**ADR** - Toxicity **Harm from omission** - Sudden drops in serum level are associated with greatest risk of relapse compared to reduced compliance with other mood stabilisers.	- Dehydration - Reduced renal function - Interacting medicines - Lack of monitoring - Transfer to a different area/team - Physical illness - Changes to salt intake	- Education for staff - Education for patients & carers - Systematic approach to monitoring including routine serum level on admission (? Done in acute/cottage hospitals) - Standardised approach to SE monitoring	- Choice & Medication website & leaflets - Reinforce at every clinical contact (include community pharmacy here) - Lithium side effect check list - Lithium ward bundle	- National monitoring standards (in development with SGHD) - Pre-administration nursing check list - SOP for management of suspected toxicity if not included elsewhere
Clozapine	**ADR** - Constipation - Weight gain & metabolic syndrome **Harm from omission** - Inappropriate treatment breaks and significant impact this has e.g. avoidable admission for re-titration and/or relapse	- Change in bowel habit - Abdominal pain - Chronic bowel obstruction - Faecal overflow - type 2 diabetes - Unnecessary admissions to re-establish treatment - Loss of symptom control - Change to smoking status - Interacting medicines - Transfer to a different area/team	- Education - Transfer checklist	- Systematic assessment at every clinical contact - Action at time of change to smoking status (planned or enforced e.g. admission to non-smoking environment)	- Pro-active treatment - Standard nursing side effect care plan - Guidelines - Effective medicines reconciliation - National clozapine physical health standards

Last Update: October 2017

Healthcare Improvement Scotland

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