Appendix 1a. **Screening Tools for Older Persons potentially inappropriate Prescriptions (STOPP)**[41]

A. Cardiovascular system		
1.	*Digoxin at a long-term dose >125µg per day with impaired renal function (increased risk of toxicity)*	
2.	*Loop diuretic for dependent ankle edema only, i.e., no clinical signs of heart failure (no evidence of efficacy, compression hosiery usually more appropriate)*	
3.	*Loop diuretic as first-line monotherapy for hypertension (safer, more effective alternative available)*	
4.	*Thiazide diuretic with a history of gout (may exacerbate gout)*	
5.	*Non-cardioselective betablocker with chronic obstructive disease (COPD) (risk of bronchospasme)*	
6.	*β-Blocker in combination with verapamil (risk of symptomatic heart block)*	
7.	*Use of ditiazem or verapamil with NYHA Class III or IV heart failure (may worsen heart failure)*	
8.	*Calcium channel blockers with chronic constipation (may exacerbate constipation)*	
9.	*Use of Aspirin and warfarin in combination without histamine H2 receptor antagonist (except cimetidine because of interaction with warfarin) or proton pump inhibitor (high risk of gastro-intestinal bleeding)*	
10.	*Dypiridamol as monotherapy for cardiovascular secondary prevention (no evidence for efficacy)*	
11.	*Aspirin with a past history of peptic ulcer disease without H2 receptor antagonist or Proton Pump Inhibitor (risk of bleeding)*	
12.	*Aspirin at dose > 150 mg/day (increase bleeding risk, no evidence for increase efficacy)*	
13.	*Aspirin with no history of coronary, cerebral or peripheral arterial symptoms or occlusive arterial event (not indicated)*	
14.	*Aspirin to threat dizziness not clearly attributable to cerebrovascular disease (not indicated)*	
15.	*Warfarin for first, uncomplicated deep venous thrombosis for longer than 6 month duration) no proven added benefits)*	
16.	*Warfarin for first uncomplicated pulmonary embolus for longer than 12 months duration (no proven benefit)*	
17.	*Aspirin, clopidogrel, dipyridamol or warfarin with concurrent bleeding disorder (high risk of bleeding)*	

B. Central nervous system		
1.	*Tricyclic antidepressants (TCA's) with dementia (risk of worsening cognitive impairment)*	
2.	*TCA's with glaucoma (likely to exacerbate glaucoma)*	
3.	*TCA's with cardiac conductive abnormalities (pro-arrhytmic effects)*	
4.	*TCA's with constipation (likely to worsen constipation)*	
5.	*TCA's with an opiate or calcium channel blocker (risk of severe constipation)*	
6.	*TCA's with prostatism or prior history of urinary retention (risk of urinary retention)*	
7.	*Long-term (i.e.> 1 month), long-acting benzodiazepines e.g. chlordiazepoxzide, fluazepame, nitrazepam, chlorazepate and benzodiazepine with long-acting metabolites e.g. diazepam (risk of prolonged sedation, confusion, impaired balance, falls)*	
8.	*Long-term (i.e.> 1 month) neuroleptics as long-terms hypnotics (risk of confusion, hypotension, extrapyramidal side effects, falls)*	
9.	*Long-term neuroleptics (> 1 month) in those with parkinsonism (likely to worsen extrapyramidal symptoms)*	
10.	*Phenothiazine in patients with epilepsy (may lower seizure threshold)*	
11.	*Anticholinergics to treat extrapyramidal side-effects of neuroleptic medications (risk of anticholinergic toxicity)*	
12.	*Selective serotonin re-uptake inhibitors (SSRI's) with a history of clinicallysignificant hyponatremia (non-iatrogenic hyponatremia<130 mmol/L within the previous 2 months)*	
13.	*Prolonged use (> 1 week) of first generation antihistamines i.e. diphenhydramine, chlorpheniramine, cyclizine, promethazine (risk of sedation and anticholinergic side effects)*	
C. Gastrointestinal system		
1.	*Diphenoxylate, loperamide or codein phosphate for treatment of diarrhea of unknown cause (risk of delaying diagnosis, may exacerbate constipation with overflow diarrhea, may precipitate toxic megacolon in inflammatory bowel disease, may delay recovery in unrecognized gastroenteritis)*	
2.	*Diphenoxylate, loperamide or codein phosphate for treatment of severe infective gastroenteritis i.e. bloody diarrhea, high fever or severe systemic toxicity (risk of exacerbation or protraction of infection)*	
3.	*Prochlorperazine or metoclopramide with Parkinsonism (risk of exacerbating of parkinsonism)*	
4.	*PPI for peptic ulcer disease at full therapeutic dosage for >8weeks (earlier discontinuation or dose reduction for maintenance/prophylactic treatment of peptic ulcer disease, oesophagitis or GORD indicated)*	

5.	*Anticholinergic antispasmodic drugs with chronic constipation (risk of exacerbation of constipation)*	
D. Respiratory system		
1.	*Theophylline as monotherapy for COPD (safer, more effective alternative; risk of adverse due to narrow therapeutic index)*	
2.	*Systemic corticosteroids instead of inhaled corticosteroids for maintenance therapy in moderate-to-severe COPD (unnecessary exposure to long term side effect of systemic steroids)*	
3.	*Nebulised ipratropium with glaucoma (may exacerbate glaucoma)*	
E. Musculoskeletal system		
1.	*NSAID with history of peptic ulcer disease or gastrointestinal bleeding, unless with concurrent histamine H2-receptor antagonist, PPI or misoprostol (risk of peptic ulcer relaps)*	
2.	*NSAID with moderate-to-severe hypertension (risk of exacerbation of hypertension)*	
3.	*NSAID with heart failure (risk of exacerbation of heart failure)*	
4.	*Long-term use of NSAID (>3 month) for symptom relief of mild osteoarthritis (simple analgesic preferable and usually as effective for pain relief)*	
5.	*Warfarin and NSAID together (risk of gastrointestinal bleeding)*	
6.	*NSAID with chronic renal failure* (risk of deterioration in renal function)*	
7.	*Long-term corticosteroids (> 3months) as monotherapy for rheumatoid arthritis or osteoarthritis (risk of major systemic corticosteroid side-effects)*	
8.	*Long-term NSAID or colchicine for chronic treatment of gout where there is no contraindication to allopurinol (allopurinol first-choice prophylactic drug in gout)*	
F. Urogenital system		
1.	*Bladder antimuscarinic drugs with dementia (risk of increased confusion, agitation)*	
2.	*Antimuscarinic drugs with chronic glaucoma (risk of acute exacerbation of glaucoma)*	
3.	*Antimuscarinic drugs with chronic constipation (risk of exacerbation of constipation)*	
4.	*Antimuscarinic drugs with chronic prostatism (risk of urinary retention)*	
5.	*α-blocker in males with frequent incontinence, i.e. one or more episodes of incontinence daily (risk of urinary frequency and worsening of incontinence)*	
6.	*α-blocker with long-term urinary catheter in situ ie. More than 2 month (drug not indicated)*	

G. Endocrine system		
1.	*Glibenclamide or chlorpropamide with type 2 diabetes mellitus (risk of prolonged hypoglycemia)*	
2.	*β-blocker in those with diabetes mellitus and frequent hypoglycemia episodes i.e. ≥ 1 episodes of incontinence daily (risk of masking hypoglycemic symptoms)*	
3.	*Estrogens with a history of breast cancer or venous thromboembolism (increase risk of recurrence)*	
4.	*Estrogens without progesterone in patients with intact uterus (risk of endometrial cancer)*	
H. Drugs that adversely affect those prone to falls		
1.	*Benzodiazepines (sedative, may cause reduced sensorium, impair balance)*	
2.	*Neuroleptic drugs (may cause gait dyspraxia, parkinsonism)*	
3.	*First generation antihistamine (sedatives, may impair sensorium)*	
4.	*Vasodilator drugs with persistent postural hypotension i.e. recurrent > 20mmHg drop in systolic blood pressure (risk of syncope, falls)*	
5.	*Long term opiates in those with recurrent falls (risk of drowsiness, postural hypotension, vertigo)*	
I. Analgesic drugs		
1.	*Use of long term powerful opiates, e.g. morphine or fentanyl as first-line therapy for mild-to-moderate pain (WHO analgesic ladder not observed)*	
2.	*Regular opiates for >2 weeks in those with chronic constipation without concurrent use of laxatives (risk of severe constipation)*	
3.	*Long-term opiates in those with dementia unless indicated for palliative care or management of moderate/severe chronic pain syndrome (risk of exacerbation of cognitive impairment)*	
J. Duplicate drug-class prescriptions		
	Any duplicate drug class prescription, e.g. two concurrent opiates, NSAIDs, SSRIs, loop diuretics, ACE inhibitors (optimizing of monotherapy within a single drug classes should be observed prior to considering a new class of drug)	

**Serum creatinine > 150 µmol/L, or estimated GFR < 50 mL/min*

Appendix 1b. **Screening Tools to Alert to Right Treatment (START)**[41]

A. Cardiovascular system		
1.	*Warfarin with chronic atrial fibrillation*	
2.	*Aspirin in the presence of chronic atrial fibrillation, where warfarin is contraindicated, but not aspirin*	
3.	*Aspirin or clopidogrel with a documented history of atherosclerotic coronary, cerebral or peripheral vascular disease in patients with sinus rhythm*	
4.	*Antihypertensive therapy where systolic blood pressure consistently > 160 mmHg*	
5.	*Statin therapy with history of coronary, cerebral, or peripheral vascular disease without contraindication*	
6.	*ACE inhibitor with chronic heart failure*	
7.	*ACE inhibitor following acute myocardial infarction*	
8.	*β-Blocker with chronic stable angina*	
B. Central nervous system		
1.	*L-DOPA in idiopathic Parkinson's disease with definite functional impairment and resultant disability*	
2.	*Antidepressant drug in the presence of moderate/severe depressive symptoms lasting at least three months*	
C. Respiratory system		
1.	*Regular inhaled β-2 agonist or anticholinergic agent for mild to moderate asthma or COPD*	
2.	*Regular inhaled corticosteroid for moderate-severe asthma or COPD, where predicted FEV1 <50%*	
3.	*Home continuous oxygen with documented chronic type 1 respiratory failure(pO_2 < 8.0 kPa, pCO_2 < 6.5 kPa) or type 2 respiratory failure (pO_2 < 8.0 kPa, pCO_2 > 6.5kPa)*	
D. Musculoskeletal system		
1.	*Disease-modifying antirheumatic drug (DMARD) with active moderate/severe rheumatoid disease lasting > 12 weeks*	
2.	*Bisphosphonates in patients taking maintenance corticosteroid therapy*	

3.	*Calcium and vitamin D supplement in patients with known osteoporosis (previous fragility fracture, acquired dorsal kyphosis)*	
E. Endocrine system		
1.	*Metformin with type 2 diabetes mellitus +/− metabolic syndrome*	
2.	*ACE inhibitor or angiotensin 2 receptor blocker in patients with diabetes and nephropathy, i.e. overt urinalysis proteinuria or microalbuminuria (>30 mg/24 hours) ± serum biochemical renal impairment**	
3.	*Antiplatelet therapy in those with diabetes mellitus and one or more major cardiovascular risk factors*	
4.	*Statin therapy in patients with diabetes mellitus and one or more major cardiovascular risk factors*	
F. Gastrointestinal system		
1.	*Proton pump inhibitor with severe gastroesophageal acid reflux disease or peptic structure requiring dilation*	
2.	*Fiber supplement for chronic, symptomatic diverticular disease with constipation*	

** Serum creatinin > 150 μmol/L, or estimated GFR < 50 mL/min*

Appendix 2. Adapted Medication Appropriateness Index (MAI)

Question per drug	Weight
1. Indication	3
2. Right choice	3
3. Dosage	2
4. Directions	1
5. Drug-drug interactions	2
6. Drug-disease interactions	2
7. Duration	1
8. Adverse drug reactions	2

Highest possible total score per drug = 16

Appendix 3. GerontoNet score[46]

Variable	Points
≥4 comorbid conditions	1
Heart failure	1
Liver disease	1
No. of drugs	
<5	0
5 – 7	1
≥8	4
Previous ADR	2
Renal failure*	1
Maximum value	10

*defined as a glomerular filtration rate of less than 60 mL/minutes

The GerontoNet consists of six criteria with a maximum value of ten per patient, i.e the number of comorbid, assessed 1 if there are were four or more comorbid in a patient, (2) assessed 1 if the patient has heart failure, (3) assessed 1 if the patient has liver disease, (4) number of drugs, assessed 0 if the number of drugs <5, assessed 1 if the number of drugs are between five and seven, assessed 4 if the number of drugs eight or more, (5) assessed 2 if the patient has ADR history, (6) assessed 1 if the patient has renal failure (GFR <60mL / min) .