

**Data Supplement S1.** Adverse Drug Events meeting the primary outcome definition (N = 202) identified in 184 of 1529 patients.

ID	Symptom/Diagnosis	Culprit Medication(s)	Laboratory Value	Severity	Case Description
<b>Adverse Drug Reactions</b>					
1047	Nausea, vomiting	Doxycycline		Moderate	48F presented with a 1-day history of nausea and vomiting after starting doxycycline 3 days ago for a lung infection. Doxycycline was discontinued.
1058	Hyperkalemia	Ramipril	K 8.2 mmol/L	Severe	77F presented with nausea and vomiting for 3 weeks. She was admitted for the management of acute kidney injury. She was treated for hyperkalemia, and ramipril was stopped.
1071	Ataxia, slurred speech, falls	Carbamazepine		Moderate	66M presented with falls, ataxia, and slurred speech secondary to carbamazepine. Carbamazepine was switched to levetiracetam and his symptoms resolved.
1089	Hypotension	Furosemide, atenolol		Moderate	73M presented with shortness of breath and a BP of 74/51. He had been discharged from hospital 3 days prior with a diagnosis of metastatic lung cancer. During that admission, his candesartan and furosemide were held before being restarted prior to discharge. On the index ED visit his hypotension was thought to be due to volume depletion from furosemide. He refused to be admitted. His atenolol dose was halved, and candesartan and furosemide were stopped.
1089	Acute kidney injury	Candesartan, recent CT contrast dye, furosemide	SCr 2.9 mg/dL	Moderate	73M presented with shortness of breath and found to have an increased creatinine (baseline 1.55mg/dL). He had been discharged from hospital 3 days prior with a diagnosis of metastatic lung cancer. During that admission, candesartan and furosemide were held before being restarted prior to discharge. On the index visit the acute kidney injury was thought to be due to volume depletion from furosemide, with candesartan and contrast dye contributing. He refused to be admitted; candesartan and furosemide were stopped.
1123	Subdural and subarachnoid hemorrhage	Warfarin	INR 5.2	Severe	81F presented with a traumatic subarachnoid hemorrhage and subdural hematoma post fall. She was admitted to hospital, where her warfarin was held and not re-prescribed.
1153	Diarrhea	Amoxicillin/clavulanate	<i>C. diff.</i> +	Severe	45F with a history of severe <i>C. difficile</i> colitis was prescribed amoxicillin/clavulanate for sinusitis. She developed recurrent colitis requiring hydration and metronidazole.
1155*	Discitis	Intravenous vitamins		Severe	36F presented with severe neck pain after a naturopath had been injecting her with multivitamins multiple times a week

					without a medical indication. She was diagnosed with cervical osteomyelitis and required 6 weeks of antibiotics.
1163	Hyperkalemia & increased acute kidney injury	Candesartan	K 6.0 mmol/L, SCr 6.6 mg/dL	Severe	84F presented with confusion and acute renal failure. Culprit medications were held on admission, and her kidney function improved. No alternative causes were identified.
1174*	Gastritis, ulcer	Naproxen		Moderate	62F presented with abdominal pain while on naproxen. She was diagnosed with NSAID-induced gastritis and an ulcer. Naproxen was discontinued and pantoprazole initiated.
1178	Gastritis	Ibuprofen		Moderate	20F presented with a 3-day history of abdominal pain, nausea and vomiting after taking ibuprofen for 1 week. No alternative causes were identified, and ibuprofen was held.
1181	Hypokalemia	Furosemide	K 2.9 mmol/L	Moderate	76F presented with dizziness and found to have hypokalemia on furosemide. Her potassium was replaced, and added her to medication regimen.
1184*	Diarrhea	Doxycycline		Moderate	55M presented with nausea, diarrhea and abdominal pain. Antibiotic-induced diarrhea was felt to be the most likely cause. Symptoms resolved after discontinuation.
1225*	Hyponatremia	Hydrochlorothiazide	Na 125 mmol/L	Moderate	89F was incidentally found to have hyponatremia on presentation. Hydrochlorothiazide was discontinued, and her sodium corrected after several days.
1250	Ataxia	Clobazam		Moderate	84M presented with ataxia after accidentally taking a double dose of clobazam prior to presentation. No alternative cause was found, and the ataxia resolved after discontinuation.
1269	Hyponatremia	Hydrochlorothiazide	Na 114 mmol/L	Severe	88F presented with confusion and weakness. She was admitted to hospital and hydrochlorothiazide was stopped.
1293	Acute kidney injury	Perindopril	SCr 1.8mg/dL	Moderate	90M presented with respiratory distress and found to have an elevated serum creatinine (baseline 1.2mg/dL). His perindopril dose was decreased.
1330*	Fall	Nitrazepam		Moderate	92F on high doses of nitrazepam presented with a fall. She was admitted for work-up that revealed orthostatic hypotension. Fludrocortisone was added to her medications, and nitrazepam stopped as it was felt to have contributed.
1334	Confusion	Zopiclone, baclofen		Moderate	73F presented with confusion after adding baclofen to her medication regimen. No alternative cause was identified. She returned to baseline after both medications were held.
1347	Dizziness	Diphenhydramine, pseudoephedrine, codeine, triprolidine		Moderate	81F presented with dizziness after starting cough syrup 3 days prior. She was diagnosed with a viral illness and instructed to stop the cough syrup. Her dizziness resolved.

1351*	Constipation	Methadone, oxycodone		Moderate	77M was admitted for the management of septic arthritis. He had a 4-day history of narcotic-induced constipation. Docusate was added to his medication regimen.
1365	Hyperglycemia	Prednisone	BG 822.6 mg/dL	Moderate	65M presented for a wound check for a necrotic leg, and was found incidentally to be hyperglycemic. The patient had not previously been diagnosed with diabetes. Prednisone was discontinued and his hyperglycemia treated.
1384	Febrile neutropenia	Eribulin	WBC 0.3 x10 <sup>9</sup> /L	Severe	69F with breast cancer presented with fever 7 days after receiving chemotherapy. She was hospitalized and treated with intravenous antibiotics.
1408	Hematoma	Warfarin	INR 3.9	Moderate	30M presented with swelling and pain in his right calf after getting kicked 5 days prior. His warfarin was felt to have contributed, and his dose was decreased.
1423*	Nausea	Hydromorphone		Moderate	44F presented with nausea after taking hydromorphone for cancer related pain. Her nausea was treated, and she was switched to a fentanyl patch.
1431*	Constipation	Hydromorphone		Moderate	43M sent in to rule out a post-operative infection. He had been constipated since starting hydromorphone, and was started on sennosides.
1439	Nausea	Paclitaxel, carboplatin		Moderate	68F presented with fever, diaphoresis, chest discomfort, vomiting and weakness since receiving chemotherapy 4 days ago. The nausea and vomiting were felt to be related to chemotherapy, and treated symptomatically.
1439	Pancytopenia	Paclitaxel, carboplatin	ANC 1.3 x10 <sup>9</sup> /L	Severe	68F presented with fever, diaphoresis, chest discomfort, vomiting and weakness since receiving her chemotherapy 4 days prior. She was hospitalized and treated with intravenous antibiotics for a suspected infection.
1449	Hypotension, fall	Ramipril, furosemide		Moderate	97F presented with hypotension (BP 85/63) and a fall causing a lumbar spine compression fracture. Daily doses of furosemide and ramipril were felt to have contributed. Both drugs were held, and the patient was admitted.
1472	Hyponatremia, abdominal pain, urinary retention	Desmopressin	Na 127 mmol/L	Moderate	67F presented with urinary retention since starting desmopressin for nocturia. Desmopressin was discontinued, and her symptoms resolved.
1478	Hyperkalemia, acute kidney injury	Ramipril, trimethoprim/sulfamethoxazole	K 6.8 mmol/L, SCr 2.9 mg/dL	Moderate	77M presented with weakness after treatment for a recent prostate abscess. He was found to have acute kidney injury, and was admitted to hospital. After hydration and removal of nephrotoxic medications, his kidney function improved.
1558	Bradycardia	Bisoprolol		Moderate	82M presented with a HR of 39, and diagnosed with second degree type 2 AV block. Bisoprolol was held.

1597	Rash	Doxycycline		Moderate	75F developed a rash after taking doxycycline. A skin biopsy confirmed the diagnosis of a drug eruption.
1637	Acute kidney injury	Furosemide, losartan	SCr 2.6 mg/dL	Moderate	80F presented after a collapse while on furosemide and losartan, and was found to have an elevated creatinine (baseline 2.1mg/dL). Furosemide was held.
1645*	Hypokalemia	Hydrochlorothiazide	K 3.0 mmol/L	Moderate	93F presented with weakness and chest tightness. She was found to be hypokalemic. Hydrochlorothiazide was stopped.
1674*	Oral thrush	Fluticasone		Moderate	93F presented with recurrent oral thrush while on fluticasone for COPD. She was treated with nystatin.
1716	Anemia, thrombocytopenia	Ifosfamide, carboplatin, etoposide	Hb 87 g/dL, platelets 34 x10 <sup>9</sup> /L	Severe	27M presented with pancytopenia after chemotherapy for hemaphagocytic lymphohistiocytosis. He was transfused. Even though he was later diagnosed with a gastrointestinal bleed, chemotherapy was felt to have contributed.
1739*	Hyponatremia	Hydrochlorothiazide	Na 116 mmol/L	Severe	65M had been recently admitted for hyponatremia while on hydrochlorothiazide. Hydrochlorothiazide had been restarted on discharge and he returned to the ED with symptomatic hyponatremia. Hydrochlorothiazide discontinued.
1741	Hypokalemia	Furosemide	K 3.0 mmol/L	Moderate	87F presented with hematuria. She was found to have hypokalemia. Potassium was added to her medications.
1750*	Hypokalemia, acute kidney injury	Furosemide	K 3.0 mmol/L, SCr 3.1 mg/dL	Moderate	74F with chronic lymphocytic leukemia presented to the ED with weakness, and was admitted for cellulitis and acute kidney injury. Her potassium was replaced and furosemide discontinued.
1752	Anemia	Fluorouracil, irenotecan	Hb 62 g/dL	Moderate	77M presented with weakness after receiving chemotherapy for colon cancer 3 weeks prior. He was transfused.
1783	Medication overuse headache	Meloxicam, ketorolac, ibuprofen		Moderate	54F with a history of headaches presented with headache while on multiple NSAIDs. Topiramate was restarted and NSAIDs were discontinued.
1804	Systemic inflammatory response syndrome	Gemcitabine		Severe	81F presented with a fever, hypotension, tachycardia, vomiting and diarrhea after receiving chemotherapy for uterine cancer 3 days prior. She was admitted for presumed sepsis, but was eventually diagnosed with gemcitabine-related systemic inflammatory response syndrome.
1804	Nausea, vomiting	Gemcitabine		Moderate	81F presented with a fever, hypotension, tachycardia, vomiting and diarrhea after receiving chemotherapy for uterine cancer 3 days prior. She was treated for nausea and vomiting related to chemotherapy.
1805*	Hypokalemia	Furosemide	K 3.3 mmol/L	Moderate	60F presented with weakness and shortness of breath. She had an incidental finding of hypokalemia 2 weeks after starting furosemide. Potassium was added to her regimen.

1832	Weight gain	Pregabalin		Moderate	33F presented with anxiety and a weight gain of 30 lbs since starting pregabalin 3 weeks previously for chronic pain. Pregabalin was stopped. No alternative cause was found.
1832	Dizziness	Pregabalin		Moderate	33F presented with anxiety and dizziness since starting pregabalin for chronic pain 3 weeks prior. Pregabalin was discontinued. No alternative cause was found.
1870	Hypoglycemia	Glyburide	BG 30.6 mg/dL	Moderate	73F was found to have decreased level of consciousness secondary to hypoglycemia. She had taken glyburide despite skipping dinner. She was switched to gliclazide.
1957	Diarrhea	Divalproex		Moderate	52F presented with 1 day of diarrhea after increasing her divalproex dose 1 week prior. Divalproex was stopped, and her symptoms resolved. No alternative cause was identified.
1962	Diarrhea	Cefuroxime, possibly nitrofurantoin	<i>C. diff.</i> +	Severe	92F presented with a fall and diarrhea a week after receiving nitrofurantoin followed by cefuroxime for a urinary tract infection. She was hospitalized with <i>C. difficile</i> colitis.
1967	Upper GI Bleed	Warfarin	Hb 110g/dL, INR 5.2	Severe	63F presented with melena. She required transfusion and was admission for an upper GI bleed. Warfarin was stopped.
2001	Epigastric pain	Hydromorphone		Moderate	85F presented with nausea and abdominal pain after taking hydromorphone for pain. She had similar reactions to hydromorphone in the past. Hydromorphone was stopped.
2011	Hepatitis	Atovaquone/proguanil	LFT > 5x upper limit of normal	Severe	65F presented with fatigue, epigastric pain, anorexia, pruritus, and dark urine while on atovaquone/proguanil. She was diagnosed with drug-induced hepatitis, and atovaquone/proguanil was discontinued.
2021	Constipation	Oxycodone, ferrous sulfate		Moderate	20M presented with chest pain and constipation after knee surgery. Laxatives were added to his medication regimen.
2046	Constipation	Codeine		Moderate	28M presented with constipation on codeine. Tylenol 3 was discontinued.
2063	Hypokalemia, supraventricular tachycardia	Hydrochlorothiazide	K 2.8 mmol/L	Moderate	67F presented with chest pain. She was diagnosed with supraventricular tachycardia secondary to hypokalemia. Her potassium was replaced.
2065	Anaphylactoid reaction	CT contrast		Moderate	40F presented with throat swelling, shortness of breath and after receiving CT contrast dye.
2071*	Hives, rash	Amoxicillin/clavulanate		Moderate	54F presented with respiratory distress secondary to a COPD exacerbation. He had a 2-day history of hives after taking amoxicillin/clavulanate, and was switched to doxycycline.
2081*	Hemoptysis	Warfarin, clopidogrel, acetylsalicylic acid	INR 3.1	Moderate	82M presented with hemoptysis while on warfarin and dual antiplatelet therapy. Warfarin was held. No alternative cause was identified.
2084	Anaphylaxis	Cephalexin		Moderate	36F presented with pruritic rash and facial swelling after 1

					dose of cephalexin for a skin infection. Cephalexin was changed to moxifloxacin.
2085*	Acute kidney injury	Ramipril	SCr 2.3 mg/dL	Moderate	68M presented with abdominal pain, and was incidentally found to have an elevated creatinine (baseline 1.1mg/dL). He had had no blood work since starting on ramipril a year prior. Ramipril was held.
2120	Fall	Lorazepam		Moderate	79F presented after a fall. Her family had given her lorazepam the last 7 nights for insomnia. Lorazepam was discontinued and no alternative cause was identified.
2146	Bleed	Acetylsalicylic acid	Hb 113 g/dL	Moderate	76M presented bleeding from a plasmacytoma in his mouth. He was stabilized with embolization of the maxillary artery. Acetylsalicylic acid was stopped.
2159	Delirium	Hydromorphone		Moderate	82F presented with confusion and dehydration 4 days after starting hydromorphone for post-surgical pain. No alternative cause for the delirium was identified.
2180	Hypotension, fall	Hydrochlorothiazide, amlodipine, ramipril		Moderate	63F presented with a collapse, syncope and a BP of 100/65. Hydrochlorothiazide, ramipril and amlodipine were discontinued. Her dizziness resolved.
2203*	Orthostatic hypotension	Sildosin		Moderate	46M had a fall with a BP of 86/44. He was diagnosed with orthostatic hypotension, and sildosin was stopped.
2204	Subarachnoid hemorrhage	Rivaroxaban		Severe	84M collapsed while on rivaroxaban. He was admitted for a subarachnoid hemorrhage, and rivaroxaban was held.
2209	Gastrointestinal bleed	Rivaroxaban, acetylsalicylic acid	Hb 119 g/dL	Moderate	65M presented with a gastrointestinal bleed while on rivaroxaban and acetylsalicylic acid. The medications were held. No source of bleeding was identified on upper and lower scopes, and his hemoglobin returned to normal.
2228	Hemoptysis	Rivaroxaban		Moderate	88M with underlying bronchiectasis presented with hemoptysis while on rivaroxaban. The medication was held, bleeding resolved, and he was switched to warfarin.
2229	Diarrhea	Trimethoprim/sulfamethoxazole	<i>C. diff.</i> +	Severe	75F presented with a 3-day history of diarrhea after finishing a course of antibiotics for a urinary tract infection. She was admitted for <i>C. difficile</i> colitis.
2234*	Long QT	Methadone	QTc 511 ms	Moderate	55M presented with a collapse and found to have prolonged QTc while on methadone.
2253*	Rectal bleed	Acetylsalicylic acid		Moderate	85M experienced rectal bleeding while on acetylsalicylic acid. He had no indication for the medication, and the drug was stopped. No alternative cause was identified.
2255	Hematuria	Rivaroxaban		Moderate	81M presented with hematuria after a Foley insertion for urinary retention while on rivaroxaban. Rivaroxaban was held for 3 days until the hematuria resolved.

2366	Rash	Trimethoprim/sulfamethoxazole		Moderate	69F presented with hives while on trimethoprim/sulfamethoxazole. They resolved after stopping the medication.
2393	Diarrhea	Tigecycline		Moderate	44M presented with diarrhea while on antibiotics for recent intra-abdominal sepsis. <i>C. difficile</i> assay was negative, but no alternative cause was identified, and the patient was felt to have drug-induced diarrhea.
2401*	Delayed wound healing	Prednisone		Severe	73F presented with impaired sternotomy wound healing and infection after coronary artery bypass grafting. Prednisone likely increased the risk of poor healing and infection.
3026*	Mild leg spasms	Aripiprazole	K 2.0 mmol/L	Moderate	50F presented with leg spasms and hypokalemia. She had developed vomiting after starting aripiprazole 1 week prior.
3027	Allergic reaction	Itraconazole		Moderate	55F presented with severe pruritis, body rash, and facial swelling after starting itraconazole. She was hospitalized for a hypersensitivity drug reaction.
3036*	Acute kidney injury	Perindopril	SCr 1.9 mg/dL	Moderate	84M presented with chest pain. He was found to have high serum creatinine (baseline 1.3mg/dL). Perindopril was held.
3044	Weakness hypokalemia	Hydrochlorothiazide	K 1.9 mmol/L	Moderate	82F presented with a 2-week history of weakness. Potassium was started and hydrochlorothiazide stopped.
3050	Constipation	Hydromorphone		Moderate	30F presented with an 11-day history of constipation since starting on hydromorphone for pain following trauma.
3068*	Acute kidney injury, hyperkalemia	Candesartan, hydrochlorothiazide, furosemide	K 5.5 mmol/L, SCr 17.1 mg/dL	Severe	76M presented with weakness. He had a 7-day history of poor intake, vomiting and diarrhea, and was found to be in acute kidney injury. Candesartan, hydrochlorothiazide, and furosemide were thought to have contributed and were held.
3086	Epistaxis	Rivaroxaban		Moderate	90M presented with recurrent epistaxis. Rivaroxaban was held and his nose packed.
3091	Acute kidney injury	Celecoxib	SCr 1.6 mg/dL	Moderate	93F presented with chest pain and was found to have a high creatinine (baseline 1.1mg/dL) after having started celecoxib 1 week prior for gout. Celecoxib was stopped.
3104	Diarrhea, abdominal pain	Trimethoprim/sulfamethoxazole, ciprofloxacin		Moderate	37F presented with diarrhea while on multiple courses of antibiotics for a UTI.
3137	Drowsiness, leg rigidity	Quetiapine, donepezil		Moderate	84M was found unresponsive after a fall. Her quetiapine had been increased 7 days ago resulting in increased sedation. The quetiapine dose was decreased.
3152*	Aphasia, leg weakness	Galantamine		Moderate	87M presented with aphasia and leg weakness. High dose galantamine had been started a week prior. She was thought to have had an unwitnessed seizure caused by galantamine. The family declined investigations, the medication was stopped, and the patient discharged.

3252	Epistaxis	Warfarin	INR 1.8	Moderate	88M presented with recurrent epistaxis exacerbated by warfarin. He required nasal packing to resolve bleeding.
3295	Decreased level of consciousness	Trazodone		Moderate	84F presented with decreased level of consciousness after being given trazodone the night prior. Trazodone was held.
3364	GI Bleed	Warfarin		Severe	78M presented with an upper gastrointestinal bleed. He was admitted for endoscopy, and warfarin was held.
3364	Acute kidney injury	Ramipril	SCr 5.1 mg/dL	Severe	78M presented with upper gastrointestinal bleed due to warfarin. He was also found to have an acute kidney injury, to which ramipril could have contributed. He was admitted and the medication held.
3381	Acute kidney injury	Furosemide	SCr 2.4 mg/dL	Severe	55M presented with shortness of breath. His furosemide was recently increased contributing to acute kidney injury.
3413	Leg cramps	Metolazone		Moderate	76M with lower extremity leg pain. Metolazone found to be contributing to dehydration, worsening leg cramps. He was admitted due to impaired mobility and metolazone was held.
3440	Subdural hematoma	Warfarin		Severe	92F presented with a subdural hematoma while on warfarin. She was admitted to hospital.
3451*	Atrial fibrillation	Ibrutinib		Moderate	63M presented with palpitations after being diagnosed with atrial fibrillation. He had started ibrutinib 6 months previously and noticed an increase in the frequency of atrial fibrillation episodes felt to be ibrutinib-related.
3459	Vomiting, epigastric pain	Amoxicillin/clavulanate		Moderate	61M presented with abdominal pain and vomiting after having started amoxicillin/clavulanate.
<b>Drug Interactions</b>					
1676	Supratherapeutic INR	Warfarin, trimethoprim/sulfamethoxazole	INR 5.7	Moderate	75F was started on trimethoprim/sulfamethoxazole 1 week previously for a presumed urinary tract infection without warfarin dose adjustment. She was found to have a high INR. She was given vitamin K and warfarin was held.
1686	Supratherapeutic INR	Warfarin, azithromycin, cefuroxime	INR 5.1	Moderate	85M presented with bilateral leg swelling. He had been prescribed azithromycin and cefuroxime for pneumonia. Warfarin was held and then restarted at a lower dose.
3315	Drowsiness	Codeine, baclofen		Moderate	55F presented after having been prescribed baclofen 4 days previously in addition to codeine she was already taking. She developed excessive drowsiness and did not experience improved pain relief. The medications were stopped.
<b>Non-Adherence</b>					
1196*	COPD exacerbation	Tiotropium, budesonide/formoterol		Severe	70F presented with a 3-week history of worsening shortness of breath after stopping her puffers. No alternative cause was found, and her medications were restarted.



1199	Heart failure exacerbation	Furosemide		Moderate	73M presented with respiratory distress. He had self-titrated his furosemide down because of frequent urination. He was admitted to internal medicine for heart failure management.
1238	Asthma exacerbation	Fluticasone/salmeterol		Moderate	33F presented with poorly controlled asthma. She had not been taking her prescribed puffers that previously controlled her asthma because she could not afford them. Her medications were restarted. No alternative cause identified.
1246	Shortness of breath	Tiotropium		Moderate	85M presented with shortness of breath secondary to noncompliance with ipratropium for COPD, as his family was unable to assist him with its administration every 6h. No alternative cause was found, and he was discharged on tiotropium, a once daily drug.
1270	Seizure	Phenytoin		Moderate	41M presented with a seizure. He had stopped phenytoin 3-4 days ago when he ran out of refills. Phenytoin was restarted.
1291	Pain	Tramadol/acetaminophen		Moderate	34F presented with pain after a urological procedure. She had been unable to fill her analgesic prescription due to cost. She was given a prescription for a less expensive drug.
1337*	Panic attacks	Paroxetine, clonazepam		Moderate	73M presented with dizziness after having stopped his medications. He presented with recurrent panic attacks, and medications were restarted.
1529*	Angina	Nitroglycerin		Moderate	71F presented with angina after forgetting to remove her nitroglycerin patch causing tachyphylaxis. Once she removed her nitroglycerin patch regularly at night her angina symptoms decreased.
1536	Heart failure exacerbation	Furosemide		Moderate	90F presented with shortness of breath after taking furosemide every other day rather than every day as prescribed. She was hospitalized for heart failure.
1546	Hyperglycemia	Insulin	BG 417.6 mg/dL	Moderate	85F was admitted with cellulitis, and incidentally found to be hyperglycemic. The geriatrician determined she was unable to manage her insulin regimen due to cognitive decline. Home care was arranged to help her manage her insulin.
1672	Seizure	Phenytoin		Moderate	32M presented with a seizure, and was found to be non-adherent with his phenytoin. The patient was counselled to re-start his medications.
1707*	Saddle pulmonary embolism	Rivaroxaban		Severe	55F presented with dyspnea after discontinuing rivaroxaban despite being told requires life-long anticoagulation. She was diagnosed with a pulmonary embolism and admitted.
1747	Hypertension	Losartan		Moderate	67F presented with uncontrolled hypertension (BP 228/121) and hemoptysis. She halved her losartan dose 2 months ago

					against medical advice. Her hypertension was treated.
1785	Uncontrolled atrial fibrillation	Bisoprolol		Severe	92M presented with shortness of breath and rapid atrial fibrillation with a HR of 130 after discontinuing bisoprolol. Bisoprolol was restarted to control his HR.
1787	Dizziness, hypotension	Prednisone		Moderate	80F presented feeling unwell and lightheaded with a BP of 110/65. She had self-tapered long-term prednisone without medical oversight. The sudden decrease in dose contributed to adrenal insufficiency. She was started on a tapering dose.
1863	Psychosis	Olanzapine		Severe	51F presented with paranoia and bizarre behavior since self-discontinuing olanzapine. She was hospitalized for psychosis and antipsychotics were restarted.
1868	Heart failure exacerbation	Furosemide		Moderate	93M presented with shortness of breath after stopping furosemide for unclear reasons. He was diagnosed with heart failure exacerbation, and furosemide was restarted.
1952*	Hyperosmolar hyperglycemic state	Insulin		Moderate	29M presented with hyperglycemia after discontinuing his insulin. He was hospitalized for hyperosmolar hyperglycemic state.
1976*	Abdominal pain	Mesalazine		Moderate	49M presented with abdominal pain after not filling his mesalazine prescription for newly diagnosed Crohn's Disease.
2035*	Pyelonephritis	Ciprofloxacin		Moderate	82M presented with dysuria after stopping ciprofloxacin 3 days into treatment for pyelonephritis. He was admitted for intravenous antibiotics.
2164	Back pain	Gabapentin		Moderate	81M presented with acute on chronic lower back pain. He had been prescribed gabapentin, but was non-compliant.
2182	Anxiety	Clonazepam		Moderate	21F presented with anxiety, after not complying with clonazepam dosing. She was referred to outpatient mental health, and started on escitalopram and clonazepam.
2186	Psychosis	Risperidone		Moderate	26M presented with bizarre behavior after not taking risperidone. He was restarted on the medication.
2242	Anxiety	Sertraline		Moderate	46M presented with non-cardiac chest pain, and found to be anxious. He had run out of a sertraline 3 weeks ago.
2286	Tachycardia	Bisoprolol		Moderate	50F presented with chest pain and tachycardia. Her HR was 176 on presentation. Despite her history of supraventricular tachycardia, she self-discontinued bisoprolol, thinking she did not need it. On follow-up, she was compliant with bisoprolol with no further issues.

2315	Back pain	Acetaminophen, hydromorphone, NSAID		Moderate	77F presented with back pain after discontinuing analgesia as prescribed. She was restarted on the same medications.
2317	Hyperglycemia	Glyburide, metformin	BG 189.0 mg/dL	Moderate	69M presented with confusion and weakness after not taking his medications. He was found to be hyperglycemic. His medications were restarted.
2335*	Hypertension	Quinapril/hydrochlorothiazide		Moderate	53F presents with hemoptysis. She was found to be hypertensive (BP 182/95) after having run out of her medications. Medications were re-prescribed.
2336*	Uncontrolled atrial fibrillation	Metoprolol		Severe	51M presented with respiratory distress and palpitations after discontinuing metoprolol in favor of herbal remedies. He was admitted for rate control.
3018	Shortness of breath	Ramipril		Moderate	79F presented to the ED for shortness of breath due to heart failure. She was noncompliant with ramipril, which was felt to have contributed to her exacerbation. No alternative cause was identified.
3063	Seizure	Levetiracetam		Moderate	77F presented with a seizure after having decreased the frequency and dose of medication. The prior dose was restarted.
3076	Seizure	Valproic acid		Moderate	48M presented with seizures after not adhering with antiepileptics secondary to substance abuse and inability to access his prescription refill.
3118	Hypoglycemia	Diabetic medications, not specified	BG 469.8 mg/dL, HA1c 0.12	Moderate	83F with dementia presented after a fall. She was found to be hyperglycemic. She refused to believe she had diabetes and had not taken her prescribed medications.
3150	Hypotension	Perindopril		Moderate	75F presented with shortness of breath on exertion and was found to be hypotensive (BP 96/56) secondary due to continuing perindopril despite having been instructed to decrease the dose. Perindopril was discontinued.
3166	Heart failure exacerbation	Furosemide		Moderate	76F presented with increased fatigue, shortness of breath, and palpitations. She had stopped taking furosemide because she felt it was ineffective. She was diagnosed with a heart failure exacerbation and resumed furosemide.
3188	Dyspepsia	Esomeprazole		Moderate	36M presented with abdominal pain after previously having been prescribed esomeprazole. He was only able to afford once daily dosing, even though twice daily dosing had been prescribed. He was restarted on twice daily.
3216	Psychosis	Olanzapine, lithium		Severe	26F was admitted for mania. She had been noncompliant with medications. Her medications were restarted in hospital.

3383*	Gastroesophageal reflux disease	Rabeprazole		Moderate	52F presents with abdominal pain and a history of reflux after running out of rabeprazole.
<b>Dosage too high</b>					
1265	Syncope	Atenolol		Moderate	66F presented with syncope and bradycardia (HR 48, BP 82/60). She was sent home after receiving volume, and was told to follow-up with her physician for atenolol dosing.
1375*	Supratherapeutic INR	Warfarin	INR>10.0	Moderate	88F was presented for a supratherapeutic INR. She had recently been started on warfarin with no monitoring or follow-up. She was given vitamin K, and warfarin was held.
1463	Fall	Olmesartan, hydrochlorothiazide		Moderate	58M presented with syncope and a BP of 102/60. He had recently reduced his antihypertensives, but his hypotension persisted. The medication was discontinued.
1573	Fall, hypotension	Amlodipine, irbesartan, hydrochlorothiazide		Moderate	74F presented with general weakness, a fall and a BP of 103/63. Amlodipine was discontinued and no further falls occurred on follow-up several months later.
1637	Syncope, hypotension	Furosemide, losartan		Moderate	80F collapsed and was found to have a BP of 80/49. She was on furosemide and losartan despite persistent hypotension. The medications were held, and furosemide discontinued.
1700	Dizziness	Hydrochlorothiazide, amlodipine, ramipril		Moderate	49M presented with dizziness. He had been dizzy since his antihypertensive doses were doubled. While normotensive in the ED, his BP was considered low for him given his history of severe hypertension. Hydrochlorothiazide was stopped.
1787	Dizziness, hypotension	Atenolol, hydrochlorothiazide		Moderate	80F presented with shortness of breath, lightheadedness and a BP of 110/65. She was on multiple antihypertensives. Her atenolol dose was reduced.
2246	Fall	Ramipril, diltiazem		Moderate	90F presented with a fall (BP 128/60 ) while on an aggressive antihypertensive regimen. Ramipril and diltiazem doses were decreased with reduced fall frequency on follow-up.
2251*	Seizures	Meperidine		Severe	55F presented after a seizure and was hospitalized for work-up. Her meperidine used for chronic pain was thought to be the cause of her seizure. No alternative diagnosis was identified, and meperidine was discontinued.
2282	Hypotension, dizziness	Ramipril, nifedipine		Moderate	99F presented with dizziness and a labile BP (BP 116/61) while on multiple antihypertensives. Her dizziness resolved after nifedipine was discontinued. No alternative cause was identified.
2287	Supratherapeutic INR	Warfarin	INR > 9.0	Moderate	87F presented with tachycardia, and was admitted for atrial fibrillation. She was found to have an elevated INR. She was

					treated with vitamin K, and her warfarin was held.
2298*	Supratherapeutic INR	Warfarin	INR 3.6	Moderate	88M presented with respiratory distress. He was incidentally found to have an elevated INR. He was given vitamin K, and warfarin was held.
2361	Hypoglycemia	Insulin	BG 32.4 mg/dL	Moderate	85F presented with hypoglycemia. She had a history of recent hypoglycemic episodes. Insulin was held and adjusted.
2362	Dizziness, acute kidney injury	Furosemide	SCr 2.7 mg/dL	Moderate	86F presented with weakness after having started furosemide for treatment of heart failure. She had been left on a high dose without reassessment. She was restarted on a lower dose of furosemide after her kidney function improved.
3085	Anxiety, insomnia, headache	Venlafaxine		Moderate	17F presented with anxiety, insomnia and headache after starting a high dose of venlafaxine a few days prior. Venlafaxine was switched to sertraline.
3088*	Supratherapeutic INR	Warfarin	INR 3.4	Moderate	89F presented with palpitations. She was found with an elevated INR for the indication (atrial fibrillation). Her warfarin dose was decreased.
3167	Supratherapeutic INR	Warfarin	>INR 10.0	Moderate	78M presented with lower extremity pain, and was found to have an elevated INR. She was admitted to hospital, her warfarin was held, and her dose was adjusted.
3233	Supratherapeutic INR	Warfarin	INR 5.4	Moderate	89M presented with slurred speech after falling. His CT head showed no bleed. However, his INR was found to be high. Warfarin was held and his dose was adjusted.
3236	Supratherapeutic INR	Warfarin	INR 8.2	Moderate	84F was sent in to the ED for an elevated INR after having started ciprofloxacin for a COPD exacerbation. Warfarin was held and vitamin K was given.
3384*	Confusion	Oxycodone, hydromorphone, morphine		Severe	75F presented with weakness and confusion. She was admitted with delirium following multiple opioid ingestions. No alternative cause was identified.
3413	Supratherapeutic INR	Warfarin	INR 3.8	Moderate	76M with incidental finding of elevated INR. Warfarin dose was adjusted.
3449*	Inadequate pain control	Analgesia		Severe	82F discharged from hospital 4 days prior with hepatocellular carcinoma and lung cancer. She was on opioids in hospital that were not re-prescribed on discharge.
<b>Dosage too low</b>					
1310	Pain	Pregabalin		Moderate	60M presented with neuropathic pain after having been started on a low dose of pregabalin 2 weeks prior without subsequent dose titration. The pregabalin dose was increased

					and tramadol added.
2368*	Diarrhea	Metronidazole		Moderate	91F presented with diarrhea after being prescribed a subtherapeutic dose of metronidazole for <i>C. difficile</i> colitis. She was hospitalized for <i>C. difficile</i> colitis.
3044	Hyperglycemia	Insulin	BG 338.4 mg/dL	Moderate	82 F presented with increased weakness and constipation. She had an incidental finding of hyperglycemia. She was admitted for hypokalemia, and blood glucose management.
3044	Constipation	Polyethylene glycol		Moderate	82F presented with a 2-week history of constipation. A low dose of polyethylene glycol had been started with no effect. The dose was increased to twice daily.
3050*	Inadequate pain control	Hydromorphone		Moderate	30F presented with pain after a motor vehicle accident despite being prescribed low dose hydromorphone. He was admitted to optimize analgesia.
3080	Inadequate pain control	Fentanyl		Moderate	71F presented with neck pain radiating down her back and legs. Low dose fentanyl patch had not been titrated.
3134*	Subtherapeutic INR	Warfarin	INR 1.7	Moderate	58M presented with shortness of breath, and was noted to have a subtherapeutic INR and inadequate warfarin monitoring (indication atrial fibrillation).
3166	Tachycardia	Metoprolol		Moderate	76F presented with a 1-week history of weakness, fatigue, shortness of breath and a HR of 134. She had stopped taking furosemide and was found to be in heart failure and atrial fibrillation. Her metoprolol was increased.
3191*	Shortness of breath	Fluticasone		Moderate	66F with COPD presented with shortness of breath taking only 250mcg fluticasone once daily, as monotherapy. No alternative trigger was identified. Medications were adjusted.
3235*	Inadequate pain control	Hydromorphone		Moderate	32F presented with shortness of breath, and neck pain. She had been prescribed low dose hydromorphone in a recent ED visit with minimal relief. Her dose was increased.
3237*	Back pain	Hydromorphone		Moderate	89F presented with uncontrolled back pain while on very small doses of hydromorphone and a fentanyl patch. The emergency physician added pregabalin to her regimen.
3337	Pain	Fentanyl		Moderate	24M presents with pain post-op after rib resection for thoracic outlet obstruction. His pain was inadequately controlled with fentanyl patches, and had not been adjusted by his surgeon earlier that day. His patch was adjusted.
3341	Leg ischemia	Warfarin	INR 1.1	Severe	77M presents with sensory loss and pain in his leg. He was diagnosed with leg ischemia secondary to low INR.
<b>Needs Additional Drug</b>					

1581	Hypertension	Triamterene/ Hydrochlorothiazide		Moderate	79F presented with poorly controlled hypertension and a BP of 231/108. Bisoprolol was added to her medication regimen.
1607*	Withdrawal	Fentanyl		Moderate	61F presented with acute on chronic pain after running out of fentanyl patches. Her fentanyl patch was re-prescribed.
1608	Diverticulitis	Clindamycin		Moderate	74F presented with persistent pain attributed to diverticulitis. She had been prescribed clindamycin monotherapy for diverticulitis. Clindamycin was switched to ciprofloxacin and metronidazole, and her symptoms resolved.
1805	Poor pain control	Hydromorphone, gabapentin		Severe	60F had an stem cell transplant for multiple myeloma a month ago, and presented with weakness and neuropathic pain after running out of hydromorphone a week ago. Gabapentin and long acting hydromorphone were started.
2241	Poorly controlled asthma	Fluticasone		Moderate	27M presented with an allergic reaction. On medication review, it was found that he had poor asthma control. He thought his salbutamol inhaler was his fluticasone inhaler. The emergency physician prescribed fluticasone.
3269*	Chest pain	Acetylsalicylic acid		Moderate	56M presented with angina with a history of cardiac arrest, percutaneous angioplasty and stents. He was only clopidogrel with no reported contra-indication to acetylsalicylic acid. Acetylsalicylic acid was started.
3336	Stump cellulitis	Inadequate antibiotic duration		Severe	43F presented with recurrent stump infection. Antibiotics were stopped after 3 weeks without reassessment of her stump. She was admitted to complete 6 weeks of antibiotics.
3427	Inadequate pain control	Required additional analgesia		Moderate	56M presented with back pain while only taking pregabalin. Her family doctor stopped naproxen and started pregabalin not considering the long duration of onset of pregabalin.
<b>Ineffective Drug</b>					
1487*	Unresolved pneumonia	Amoxicillin		Moderate	44M presented with a fever and cough. He had been prescribed amoxicillin in the community for pneumonia but saw no improvement. He was switched to moxifloxacin.
2106*	Pyelonephritis	Nitrofurantoin		Severe	51F presented with flank pain. She had been prescribed nitrofurantoin for a urinary tract infection 5 days ago despite poor renal function. She was admitted for intravenous antibiotics.
3031*	Urinary tract infection	Nitrofurantoin		Moderate	87F presented with confusion. Five days prior, she had been diagnosed with a urinary tract infection and started on nitrofurantoin. Cultures grew Proteus resistant to nitrofurantoin. She was admitted for intravenous antibiotics.
3189	Urinary tract	Nitrofurantoin		Moderate	26F presented with flank pain, after being prescribed with

	infection				nitrofurantoin despite initial symptoms of pyelonephritis.
3190	Constipation	Lactulose		Moderate	85M presented with constipation while on narcotics after a fall. An additional laxative was prescribed.
3190	Ineffective analgesia	Codeine		Moderate	85M presented with poor pain control while on codeine after a fall. Codeine was switched to hydromorphone.
3091	Ineffective analgesia	Tramadol		Moderate	93M with inadequate pain control. He felt it was ineffective. Hydromorphone was prescribed.
3220*	Supraventricular tachycardia	Digoxin		Moderate	67F with a history of supraventricular tachycardia presented with a HR of 182. She had refused to try medications other than digoxin, despite it being ineffective in the past.
3330	Dyspepsia	Pantoprazole, naproxen		Moderate	60F presented with symptoms of dyspepsia related to naproxen. Pantoprazole had been prescribed without discontinuing naproxen. In the ED, naproxen was stopped and pantoprazole increased to 40mg bid.
3424	Auricular cellulitis	Cloxacillin		Moderate	76M presented with cellulitis despite 2 courses of cloxacillin, which is poorly absorbed. The patient was successfully treated with cefazolin and ciprofloxacin.
<b>Medication Error</b>					
1386*	Hyperglycemia	Insulin	BG 340.2 mg/dL	Moderate	62F presented with hyperglycemia felt to be due to an error in self-management. She was enrolled in a daily dispensing and medication management program resulting in improved glucose control.
1540	Hypotension, bradycardia	Metoprolol, verapamil, diltiazem		Moderate	70M presented with a collapse and hypotension (BP 84/52). He had recently been hospitalized for coronary bypass surgery, and had been started on verapamil. On discharge, he continued these medications and also restarted medications he took prior admission including metoprolol and diltiazem. Metoprolol and diltiazem were stopped.
2392	Hypotension	Amlodipine, candesartan		Moderate	83F presented with confusion and hypotension (BP 115/50). She had taken multiple days of medications from her blister pack, including multiple doses of antihypertensives. She was enrolled in a medication management program.
2392	Diarrhea	Sennosides		Moderate	83F presented with confusion and diarrhea. She had taken multiple days of medications from her blister pack, including multiple doses of sennosides. She was enrolled a medication management program.



3325*	Long QT	Trimipramine		Moderate	90F presented with shortness of breath due to a COPD exacerbation. Trimipramine had been discontinued due to prolonged QTc. Two weeks later the patient moved to a nursing home, and trimipramine was restarted. The medication was discontinued after the index visit.
<b>Drug Withdrawal</b>					
1089*	Hypotension, adrenal insufficiency	Dexamethasone		Moderate	73M newly diagnosed with metastatic lung cancer developed symptomatic hypotension (BP 74/51) while on a rapid dexamethasone taper. No alternative cause was identified. The dexamethasone dose was increased.
1261	Pain	Morphine		Moderate	20M presented with pain. He had a history of narcotic dependence and was on a tapering dose of morphine. He ran out of morphine and presented in withdrawal.
1456	Anxiety, insomnia	Venlafaxine		Moderate	60F presented with insomnia, nightmares and anxiety after her family doctor abruptly stopped venlafaxine. She was restarted on venlafaxine with a slow taper.
1488	Dizzy, pain	Hydromorphone		Moderate	45F presented with back pain and in withdrawal after running out of hydromorphone. She was restarted on a tapering dose of hydromorphone.
1706	Anxiety, insomnia	Clonazepam		Moderate	68M presented with anxiety and insomnia after clonazepam was reduced rapidly. The emergency physician prescribed lorazepam, and the patient's symptoms resolved. The patient's family physician tapered him off benzodiazepines.
1807	Nausea, vomiting	Hydromorphone		Moderate	75F presented with nausea, vomiting and abdominal cramping since running out of hydromorphone. Hydromorphone was restarted at a lower dose.
2129*	Seizure	Clonazepam		Moderate	60F seized after running out of clonazepam 4 days prior. She had been taking clonazepam for insomnia. She was restarted on a tapering dose of clonazepam.

\* Indicates adverse drug events not initially recognized by the physician. All events identified by pharmacists were disclosed to the treating physician at the point-of-care to optimize patient safety. An independent committee adjudicated all events classified as uncertain or discordant.

K=potassium; BP=blood pressure; ED=emergency department; SCr=serum creatinine; INR=international normalized ratio; BG=blood glucose; WBC=white blood cell; ANC=absolute neutrophil count; Na=sodium; HR=heart rate; Hb=hemoglobin; QTc=corrected QT interval; ms=milliseconds; NSAID=non-steroidal anti-inflammatory drug; HA1c=hemoglobin A1c; COPD=chronic obstructive pulmonary disease