

### Online appendix 1: Types of Medication Error during Hospital Discharge

Medication Error	Definition
Wrong Drug	Prescribing a wrong medication for the patient. Example prescribing a sound alike medication of the intended medication. <b>Example:</b> <i>prescribing hydroxyzine instead of hydrochlorothiazide.</i>
Medication not Indicated	Unintentional additional of medication with no indication. <b>Example:</b> <i>prescribing SC fondaparinux 2.5mg once daily which was only intended during hospital stay.</i>
Wrong Dose	Prescribing dose of a drug higher or lower that is not intended. <b>Example:</b> <i>perindopril 4mg instead of 2mg.</i>
Wrong Frequency	Prescribing frequency of a drug that is not intended. <b>Example:</b> <i>ivabradine 5mg once daily instead of twice daily.</i>
Wrong Duration	Prescribing duration of a drug longer or shorter than intended. <b>Example:</b> <i>amoxicillin 1gm twice daily to complete one week instead of two weeks.</i>
Wrong Route	Prescribing route of medication that is not intended. <b>Example:</b> <i>Prescribing tablet cyanocobalamin instead of subcutaneous (SC) cyanocobalamin.</i>
Wrong Formulation	Prescribing formulation medication that is not intended. <b>Example:</b> <i>trimetazidine MR prescribed as trimetazidine.</i>
Contraindication	Prescribing a drug for a patient for whom, as a result of a co-existing clinical condition, that drug is contraindicated. <b>Example:</b> <i>Prescribing spironolactone in a patient with creatinine clearance less than 30ml/min.</i>
Allergy	Prescription of a drug to which the patient has a documented clinically significant allergy <b>Example:</b> <i>Prescribing diclofenac sodium in a patient with documented allergies for non-steroidal ant-inflammatory drugs (NSAIDs).</i>
Polypharmacy	Prescribing multiple drugs for same indication. <b>Example:</b> <i>Prescribing metoclopramide and domperidone concurrently.</i>
Omission of Medication	Unintentionally not prescribing a drug that was intended for patient. <b>Example:</b> <i>Omission of ticagrelor as part of dual antiplatelet therapy.</i>
Omission of Instruction	Unintentionally not including special instruction for a drug. <b>Example:</b> <i>Omitting instruction of short acting insulin to be injected pre-lunch and pre-dinner as ordered by endocrinologist.</i>

## Online appendix 2: Example of Clinically Significant Errors

### Omission Error

A 48-years-old female patient was admitted for adrenal insufficiency with underlying bronchial asthma. The house officer that prescribed her discharge medications unintentionally omitted tablet hydrocortisone 10mg twice daily. Ward pharmacist detected the error the following morning. House officer, mistook the indication of hydrocortisone as for acute exacerbation of asthma and hence did not prescribe it.

Patient was called back and tablet hydrocortisone was supplied till her next appointment day at the specialist clinic.

### Wrong Dose

A 88-years-old male patient was discharged with the diagnosis of uncontrolled diabetes mellitus (DM) and recurrent ischemic stroke. SC insulin isophane human - insulin neutral human 30 unit/ml-70units/ml was unintentional prescribed as 14 units twice daily instead of 16 units twice daily as planned in the bed head ticket during discharge.

The prescription was prepared after office hours, and medications were collected from the outpatient pharmacist.

Ward pharmacist encountered the prescribing error the next morning and discussed the error with the attending physician.

Decision was made to contact patient and sufficient insulin cartridge and correct label was prepared. Patient was also informed of the change in insulin dose.

### Wrong Frequency

A 68-year-old female was admitted for post stroke seizure and tablet clonazepam 0.25mg three time daily was started in the ward. The patient received a discharge prescription of tablet clonazepam 0.25mg once daily.

The wrong frequency was not detected by outpatient pharmacist as the dosing is appropriate based on standard drug dosing reference for elderly.

The following morning, ward pharmacist informed the prescribing error to the attending physician and decision was made to contact patient regarding the medication error.

### Drug Not Indicated

A 50-year-old male patient that was admitted for non-ST elevation myocardial infarction (NSTEMI) was prescribed with tablet acetylsalicylic acid and tablet warfarin for atrial fibrillation (AF) in the ward. During hospital stay, patients had an episode of hematuria and both acetylsalicylic and warfarin was withheld and decision was made to continue only clopidogrel as single antiplatelet therapy in view of high risk for bleeding.

However, tablet acetylsalicylic acid 150mg one daily, tablet clopidogrel 75mg once daily, and tablet warfarin 3mg once daily along with other acute coronary syndrome (ACS) therapy was prescribed.

Ward pharmacist noticed that acetylsalicylic acid and warfarin was not withheld as planned the following morning and informed attending physician.

### Wrong Duration

A male patient aged 44 years and was admitted with the primary diagnosis of acute exacerbation of bronchial asthma. He was started on montelukast 10 mg once daily for 2 months till next appointment in clinic. He however was prescribed montelukast for only 2 weeks.

Upon detection of this error by ward pharmacist, physician requested to contact patient and sufficient amount of montelukast was supplied to patient for better management of his asthma.

### Online appendix 3: Drugs Involved in Commission Error

#### Drugs Involved in Wrong Formulation

Drugs Involved	Total, n
Metformin – Metformin XR	8
Trimethazidine – Trimethazidine MR	5
Isosorbide Mononitrate – Isosorbide Dinitrate	3
Theophylline – Theophylline SR	2
Gliclazide – Gliclazide MR	2
Nifedipine – Nifedipine XR	1
Madopar – Madopar HBS	1
Carbamazepine – Carbamazepine CR	1

#### Drugs Involved in Wrong Drug Errors

Intended Drug	Wrong Drug Prescribed
Amlodipine	Abacavir
Acetylsalicylic Acid and Glycine	Acetylsalicylic Acid
Atorvastatin	Atenolol
Bisoprolol	Atenolol
Cyanocobalamin	Mecobalamin
Fusidic Acid Cream	Fusidic Acid 2% in Betamethasone Valerate 0.1% Cream
Haloperidol	Diazepam
Insulin Recombinant Neutral Human Short Acting (Actrapid®)	Insulin Recombinant Synthetic Human Intermediate Acting (Insulatard®)
Insulin Recombinant Synthetic Human Intermediate Acting (Insulatard®)	Insulin Recombinant Neutral Human Short Acting (Actrapid®)
Metformin	Insulin Recombinant Neutral Human Short Acting (Actrapid®) Insulin Recombinant Synthetic Human Intermediate Acting (Insulatard®)
Perindopril and Indapamide	Perindopril
Rosuvastatin	Atorvastatin
Sodium Bicarbonate Powder	Sodium Chloride Powder
Zincofer®	Iberet Folic®

**Online appendix 4: Anatomical Therapeutic Chemical (ATC) Classification of Drugs Involved in Omission Error**

<b>Anatomical Therapeutic Chemical</b>	<b>Total, N=160, n (percentage, %)</b>
<b>Cardiovascular System</b>	<b>58 (36.2)</b>
<ul style="list-style-type: none"> <li>• <i>Organic Nitrate</i></li> <li>• <i>Calcium Channel Blocker</i></li> <li>• <i>HMG CoA Reductase Inhibitors</i></li> <li>• <i>Diuretics</i></li> <li>• <i>Beta Blocker</i></li> <li>• <i>Alpha Blockers</i></li> <li>• <i>Digitalis Glycoside</i></li> <li>• <i>Fibrates</i></li> </ul>	<p>17</p> <p>11</p> <p>11</p> <p>9</p> <p>4</p> <p>3</p> <p>2</p> <p>1</p>
<b>Alimentary Tract and Metabolism</b>	<b>42 (26.3)</b>
<ul style="list-style-type: none"> <li>• <i>Proton Pump Inhibitor</i></li> <li>• <i>Insulin</i></li> <li>• <i>Calcium Compound</i></li> <li>• <i>Vitamins</i></li> <li>• <i>Laxatives</i></li> <li>• <i>Mineral Supplement</i></li> <li>• <i>Sulfonylurea</i></li> <li>• <i>Biguanides</i></li> <li>• <i>H2 Receptor Antagonist</i></li> </ul>	<p>9</p> <p>7</p> <p>7</p> <p>7</p> <p>5</p> <p>3</p> <p>2</p> <p>1</p> <p>1</p>
<b>Blood and Blood Forming Organ</b>	<b>23 (14.4)</b>
<ul style="list-style-type: none"> <li>• <i>Platelet Aggregation Inhibitor</i></li> <li>• <i>Iron Preparation</i></li> <li>• <i>Folic Acid and Derivatives</i></li> <li>• <i>Direct Thrombin Inhibitor</i></li> <li>• <i>Vitamin B12</i></li> </ul>	<p>12</p> <p>6</p> <p>3</p> <p>1</p> <p>1</p>
<b>Respiratory System</b>	<b>16 (10.4)</b>
<ul style="list-style-type: none"> <li>• <i>Adrenergic</i></li> <li>• <i>Adrenergic &amp; Corticosteroid Combination</i></li> <li>• <i>Anticholinergic</i></li> <li>• <i>Leukotriene Receptor Antagonist</i></li> <li>• <i>Corticosteroid</i></li> </ul>	<p>5</p> <p>4</p> <p>3</p> <p>2</p> <p>2</p>
<b>Nervous System</b>	<b>8 (5.2)</b>
<ul style="list-style-type: none"> <li>• <i>Antipsychotics</i></li> <li>• <i>Salicylic Acid</i></li> <li>• <i>Antiepileptics</i></li> <li>• <i>Antihistamine</i></li> </ul>	<p>4</p> <p>2</p> <p>1</p> <p>1</p>
<b>Ant infectives</b>	<b>8 (5.2)</b>
<b>Systemic Hormonal Preparation</b>	<b>4 (2.6)</b>
<ul style="list-style-type: none"> <li>• <i>Corticosteroids</i></li> <li>• <i>Thyroid Hormone</i></li> </ul>	<p>2</p> <p>1</p>
<b>Genito urinary System &amp; Sex Hormone</b>	<b>1 (0.6)</b>
<ul style="list-style-type: none"> <li>• <i>Drug use in Benign Prostatic Hypertrophy</i></li> </ul>	<p>1</p>