

## **MSc Physician Associate Studies Drug Formulary**

### **Medicine management**

One of the aims of the MSc Physician Associate Studies curriculum is to make you aware of safe prescribing practices. Medicine management is therefore an important thread throughout the course, and the clinical placements over both years will allow you to learn about the drugs that you are most likely to see in use as a newly qualified physician associate, building on what you have learnt in taught sessions at the university.

We know that it can be a daunting task and we have devised the following guidance to help you develop your own personal student formulary. There are many hundreds of drugs available, and it is clearly not possible for the newly qualified PA to have in-depth knowledge of all of them. The drugs are therefore categorised into three categories (E, B, and S) in order to guide students about how much they need to learn about particular drugs.

Red flag drugs marked by ▼ are those where strong emphasis should be given to teaching and learning (pharmacology, administration, routes, interactions, monitoring) as they are areas of patient safety concerns across the NHS; these include blood products, intravenous fluids, antibiotics, analgesics (including opiates), insulins and anticoagulants/anti-thrombotics. Students will be expected to pay particular attention to red flag drugs in relation to wider contexts around prescribing procedures, patient evaluation and safety.

### **Category E (emergency drugs)**

The newly qualified PA should know the indications, doses, and routes of administration of Category E drugs when they are used in an emergency. This refers to life-threatening conditions in which the drug has to be given immediately.

You will start to learn about some of these drugs on placement in year 2 when you cover about how to manage emergencies. By the end of year 2 you should have an in-depth knowledge of all of these medications. Some of these drugs will also be included in Category B, but for indications outside of emergencies.

### **Category B (basic drugs)**

The newly qualified PA should have sufficient knowledge of a Category B drug to be able to suggest prescribing it. The newly qualified PA should be aware of important contraindications, adverse effects, and interactions, and should be able to institute the appropriate monitoring for benefit and harm and suggest when the dose should be adjusted accordingly.

By the end of year 2 the PA student would be expected to know about these drugs in detail, their main indications, their important contraindications, their adverse effects, important drug interactions, the effects of renal and liver failure on their use, and how to monitor therapy.

### **Category S (specialist drugs)**

A newly qualified PA would not be expected to have an in-depth knowledge of a Category S drug, but should recognise its name and class and be aware of the main indications for its use. For the purposes of the 2<sup>nd</sup> year examinations the PA student would not be examined in depth about these drugs but would be expected to have a passing knowledge of these.

To help develop your own student formulary we would like you to complete the following drug profile sheets. Some of the information that you need for these will be obtained during central teaching sessions, some on clinical placement and some during self-directed learning time. We recommend using **The Top 100 Drugs: Clinical Pharmacology and Practical Prescribing** as a guide for level of detail required for basic and emergency drugs.

You may want to consider getting together with other students, learning about different medicines and sharing your knowledge, or arranging for some of the drugs to be discussed as part of tutorials during your clinical attachments. If you look at the drug chart or the prescription for a patient you will find that the same drugs appear frequently, you will see that these are the drugs that we have tried to concentrate on for our student formulary.

<b>Emergency</b>	<b>Emergency drugs (Category E)</b>
<b>Cardiac arrest</b>	Adrenaline (IV) Amiodarone (IV)
<b>Acute pulmonary oedema</b>	Furosemide (IV) Oxygen ▼
<b>Acute severe asthma</b>	Beta-2 adrenoceptor agonists (e.g. nebulised salbutamol) Ipratropium Oxygen ▼ Hydrocortisone (IV) Magnesium sulphate (IV)
<b>Anaphylactic shock</b>	Adrenaline (IM) Hydrocortisone (IV) Chlorphenamine (IV) Intravenous fluids (IV)
<b>Benzodiazepine intoxication</b>	Flumazenil (IV)
<b>Hypoglycaemia</b>	Glucose (IV) Glucagon (SC or IM)
<b>Hypovolaemic shock</b>	Intravenous fluids
<b>Opioid intoxication</b>	Naloxone (IV or IM)
<b>Seizures</b>	Diazepam/lorazepam/Phenytoin
<b>Hyperkalaemia</b>	Calcium gluconate or calcium chloride (IV), Insulin-glucose solution (IV), Salbutamol (nebs)

<b>Specialty</b>	<b>Basic drugs (Category B)</b>	<b>Specialist drugs (Category S)</b>
<b>Anaesthesia</b>	Local anaesthetics (lidocaine, bupivacaine) Intravenous fluids, Electrolytes (potassium ▼, sodium)	General anaesthetics
<b>Cardiovascular</b>	Diuretics: - Loop diuretics e.g. furosemide - Thiazide diuretics e.g. indapamide - K-sparing diuretics e.g. spironolactone ACE inhibitors e.g. ramipril Beta-blockers e.g. atenolol, bisoprolol Nitrates e.g. isosorbide mononitrate Calcium channel blockers e.g. amlodipine Angiotensin II receptor antagonists (ARBs) e.g. losartan	Alpha blockers e.g. doxazosin Potassium channel activator e.g. nicorandil Ivabradine Ranolazine
	Aspirin Clopidogrel Anticoagulants (heparin, low-molecular weight heparin ▼, warfarin ▼) NOACs ▼ e.g. rivaroxaban, dabigatran	Thrombolytic agents Other antiplatelet agents Other fibrinolytic agents Other anticoagulants
	Statins (HMG-CoA reductase inhibitors) e.g. atorvastatin	Other lipid-lowering agents
	Digoxin Amiodarone	Adenosine Dobutamine Other antidsrhythmic drugs
<b>Dermatology</b>	Basic principles of using drugs on the skin Emollients Oral antihistamines (H1 receptor antagonists) e.g. chlorphenamine, cetirizine Topical glucocorticoids e.g. hydrocortisone, betamethasone	Topical imidazoles Topical antimicrobial drugs Permethrin cream in scabies Benzoyl peroxide Topical and oral retinoids Topical vitamin D analogues Coal tar
<b>Endocrine/ Metabolic</b>	Insulins ▼ Sulphonylureas eg. Gliclazide Biguanides eg. Metformin	Meglitinides (repaglinide and related drugs) Acarbose

	Glitazones e.g. pioglitazone Glucagon (see also emergency drugs)	Incretin mimetics e.g. exenatide Fludrocortisone
	Levothyroxine Carbimazole	Propylthiouracil Liothyronine (tri-iodothyronine) & Iodine
	Glucocorticoids e.g. prednisolone	Vasopressin and analogues Spironolactone Octreotide and analogues Fludrocortisone
<b>ENT</b>	Basic principles of administering drugs to the ears and nose (topical antibiotics, steroids)	
<b>Gastrointestinal</b>	Stimulant Laxatives e.g. senna, Osmotic laxatives e.g. lactulose, macrogols. Antidiarrhoeal drugs e.g. loperamide	Aminosalicylates e.g. Mesalazine, sulphasalazine
	Antacids/ alginates e.g. gaviscon Histamine H2 receptor antagonists e.g. ranitidine Proton pump inhibitors e.g. lansoprazole Antispasmodics e.g. mebeverine, hyoscine butylbromide	DMARDs ▼ e.g. azathioprine, ciclosporin, mycophenolate
<b>Haematology</b>	Iron eg ferrous sulphate Vitamin B <sub>12</sub> (hydroxocobalamin) Folic acid Vitamin K Blood ▼	Chemotherapeutic agents Folinic acid
<b>Infectious diseases</b>	<i>Anti-bacterials</i> Beta-lactams Penicillins ▼: benzylpenicillin and phenoxymethylpenicillin Broad spectrum penicillins ▼: amoxicillin & pivmecillinam Penicillinase-resistant penicillin ▼: flucloxacillin Beta lactam-beta-lactamase inhibitor combinations ▼: amoxicillin-clavulanic acid and piperacillin-tazobactam Cephalosporins: cephalexin,	<i>Anti-bacterials</i> Beta-lactams Carbapenems: ertapenem, imipenem, meropenem Monobactam: aztreonam Non-beta-lactams Fidaxomicin Fosfomicin Co-trimoxazole Chloramphenicol Fusidic acid Linezolid Mupirocin <i>Antifungals</i> Amphoteracin, Echinocandins: anidulafungin <i>Anti-</i>

	<p>cefuroxime, cefotaxime, ceftriaxone, ceftazidime and ceftaroline</p> <p>Non-beta-lactams</p> <p>Aminoglycosides: gentamicin and amikacin</p> <p>Macrolides: erythromycin, clarithromycin and azithromycin</p> <p>Clindamycin</p> <p>Glycopeptides: Vancomycin and Teicoplanin</p> <p>Metronidazole</p> <p>Nitrofurantoin</p> <p>Quinolones: ciprofloxacin and levofloxacin</p> <p>Tetracyclines: doxycycline, Tigecycline</p> <p>Trimethoprim</p> <p><i>Anti-fungals</i></p> <p>Azoles: clotrimazole and fluconazole, Nystatin</p> <p><i>Anti-viral</i> agents: aciclovir and valciclovir</p>	<p><i>helminthic drugs</i></p> <p><i>Anti-leprosy drugs</i></p> <p><i>Anti-protozoal drugs</i> including antimalarial drugs</p> <p><i>Anti-tuberculosis drugs</i></p> <p><i>Anti-virals</i>: HIV drugs</p>
<b>Musculoskeletal</b>	<p>NSAIDs ▼ e.g. ibuprofen, naproxen</p> <p>Glucocorticoids e.g. prednisolone</p> <p>Methotrexate ▼</p>	DMARDs ▼
	Allopurinol	Colchicine Uricosuric agents
	<p>Calcium salts</p> <p>Bisphosphonates e.g. alendronate</p> <p>Vitamin D analogues</p>	
<b>Neurology</b>	<p>Carbamazepine</p> <p>Phenytoin ▼</p> <p>Valproate</p>	Other antiepileptic drugs e.g. lamotrigine, levetiracetam
	<p>Levodopa and dopa-decarboxylase inhibitors (co-careldopa, co-beneldopa)</p> <p>Anticholinergic drugs (e.g. procyclidine, trihexyphenidyl)</p>	Other drugs used in Parkinson's disease (e.g. dopamine receptor agonists, COMT inhibitors, selegiline)
	Triptans e.g. sumatriptan	
<b>Obstetrics &amp; Gynaecology</b>	<p>Oral contraceptives ▼</p> <p>Long acting progestogens</p> <p>Intra-uterine device</p>	<p>Oxytocic drugs</p> <p>Danazol</p> <p>Antibiotics for PPROM, UTI, post LSCS, third/fourth</p>

		<p>degree tears</p> <p>LMWH for prophylaxis and treatment of VTE</p> <p>Oral iron supplementation</p> <p>Low dose aspirin for PET prevention and to improve placental circulation</p> <p>Labetalol, methyldopa and nifedipine for hypertension in pregnancy</p> <p>Syntometrine® (ergometrine/oxytocin)</p> <p>Constipation medication in pregnancy</p>
	Hormone replacement therapies ▼	
		Gonadotrophin releasing hormone agonists
	Mefenamic acid and tranexamic acid for HMB	Stress incontinence medication
		Topical genital wart home treatments
<b>Oncology</b>	Basic principles of cancer chemotherapy ▼	<p>All specific drugs</p> <p>Eg. Cytotoxic agents- Doxorubicin</p> <p>Hormonal cancer treatment- Anastrozole</p> <p>Cell signalling inhibitor- Trastuzumab</p>
<b>Ophthalmology</b>	<p>Basic principles of using eye drops</p> <p>Drugs used in glaucoma</p> <p>Ocular lubricants e.g. hypromellose</p> <p>Ocular topical antibiotics e.g. chloramphenicol, fucidic acid</p>	Antimicrobial drugs
<b>Paediatrics</b>	<p>Basic principles of using drugs in children (BNF-C), including simple analgesia, oxygen</p> <p>Bronchodilators and inhaled steroids for asthma (including appropriate delivery)</p> <p>Antimicrobial drugs for suspected meningitis/sepsis ▼, and for pneumonia, urinary tract infection and (when appropriate) ENT infections.</p> <p>Laxatives appropriate for children</p>	<p>Oral/nebulised steroids for croup</p> <p>Immunisations</p> <p>Cystic fibrosis treatment</p> <p>Insulin</p> <p>Antiepileptics</p> <p>Desmopressin</p> <p>UTI prophylaxis</p> <p>Corticosteroids for nephritic syndrome</p>

	Emollients and topical steroids for eczema Oral rehydration fluids Maintenance, rehydration and bolus intravenous fluids Immunisations	Ergocalciferol/ cholicalciferol for rickets
<b>Pain relief and palliative care</b>	Opioid analgesics ▼ (e.g. co-codamol, morphine) Paracetamol NSAIDs ▼ e.g. Ibuprofen Neuropathic agents e.g. amitriptyline	Other opioid analgesics e.g. oxycodone, fentanyl
	Antiemetics: Dopamine receptor blockers e.g. Metoclopramide Phenothiazine antiemetics e.g. prochlorperazine Antihistamines eg. Cyclizine	Domperidone Haloperidol 5HT3 receptor antagonists e.g. ondansetron Levomepromazine
	End of Life Anticipatory Medications Anxiolytic e.g. midazolam Antisecretory e.g. hyoscine Anti-emetic Opioid	
<b>Psychiatric</b>	Benzodiazepines ▼ e.g. diazepam, temazepam Z drugs e.g. Zopiclone Zolpidem	
	Tricyclic antidepressants ▼ e.g. amitriptyline SSRIs e.g. sertraline, citalopram NaSSA e.g. Mirtazapine	MAOIs SNRIs e.g. Venlafaxine, duloxetine
	Mood stabilizers- Lithium ▼	Sodium/semisodium valproate Lamotrigine
	Anti-dementia drugs: Acetyl Cholinesterase inhibitors e.g. donepezil, galantamine, rivastigmine	Memantine
	Antipsychotic drugs Typical/1st generation e.g. chlorpromazine, haloperidol Atypical/2nd generation e.g. olanzapine, quetiapine,	Other 2nd generation: e.g. risperidone, aripiprazole 3rd generation -Clozapine Depot antipsychotic medication

<b>Respiratory</b>	Beta-2 adrenoceptor agonists e.g. salbutamol, salmeterol Compound bronchodilators/steroids e.g. seretide® Anticholinergic drugs e.g. ipratropium, tiotropium Xanthines e.g. theophylline Corticosteroids ▼ e.g. beclometasone Oxygen Mucolytics e.g. Carbocisteine	Leukotriene receptor antagonists e.g. montelukast Cromones (cromoglicate)
<b>Urinary tract</b>	Alpha-adrenoceptor antagonists e.g. tamsulosin Phosphodiesterase type-5 inhibitors e.g. sildenafil Antimuscarinic drugs e.g. oxybutynin, tolterodine	GnRH analogues Finasteride Flutamide, bicalutamide
<b>Self-poisoning</b>	General management Activated charcoal (single and repeated doses) N-acetylcysteine	Specific antidotes

## Drug Profile sheet

<b>Drug name</b> Approved or generic?	
<b>Drug class</b>	
<b>How does it work?</b>	
<b>Indications</b>	
<b>Contra-indications</b>	
<b>Side-effects</b>	
<b>Possible interactions</b> (and mechanism)	
<b>Elimination</b>	
<b>Patient information</b>	