**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 are 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 2nd 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.

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

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| **Specialty** | Basic drugs (Category B) | Specialist drugs (Category S) |
| **Anaesthesia** | Local anaesthetics (lidocaine, bupivacaine)Intravenous fluids, Electrolytes (potassium**▼**, sodium) | General anaesthetics |
| **Cardiovascular** | Diuretics:- Loop diuretics e.g. furosemide- Thiazide diuretics e.g. indapamide- K-sparing diuretics e.g. spironolactoneACE inhibitors e.g. ramiprilBeta-blockers e.g. atenolol, bisoprololNitrates e.g. isosorbide mononitrateCalcium channel blockers e.g. amlodipineAngiotensin II receptor antagonists (ARBs) e.g. losartan | Alpha blockers e.g. doxazocinPotassium channel activator e.g. nicorandilIvabradineRanolazine |
|  | AspirinClopidogrelAnticoagulants (heparin, low-molecular weight heparin▼, warfarin▼)NOACs▼ e.g. rivaroxaban, dabigatran | Thrombolytic agentsOther antiplatelet agentsOther fibrinolytic agentsOther anticoagulants |
|  | Statins (HMG-CoA reductase inhibitors) e.g. atorvastatin | Other lipid-lowering agents  |
|  | DigoxinAmiodarone | Adenosine DobutamineOther antidsrhythmic drugs |
| **Dermatology** | Basic principles of using drugs on the skinEmollientsOral antihistamines (H1 receptor antagonists)e.g. chlorphenamine, cetirizineTopical glucocorticoids e.g. hydrocortisone, betamethasone | Topical imidazolesTopical antimicrobial drugsPermethrin cream in scabiesBenzoyl peroxideTopical and oral retinoidsTopical vitamin D analoguesCoal tar |
| **Endocrine/ Metabolic** | Insulins▼Sulphonylureas eg. GliclazideBiguianides eg. MetforminGlitazones e.g. pioglitazoneGlucagon (see also emergency drugs) | Meglitinides (repaglinide and related drugs)AcarboseIncretin mimetics e.g. exenatideFludrocortisone |
|  | LevothyroxineCarbimazole | PropylthiouracilLiothyronine (tri-iodothyronine) & Iodine |
|  | Glucocorticoids e.g. prednisolone | Vasopressin and analoguesSpironolactoneOctreotide and analogues Fludrocortisone |
| **ENT** | Basic principles of administering drugs to the ears and nose (topical antibiotics, steroids) |  |
| **Gastrointestinal** | 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. gavisconHistamine H2 receptor antagonists e.g. ranitidineProton pump inhibitors e.g. lansoprazoleAntispasmodics e.g. mebeverine, hyoscine butylbromide | DMARDs▼e.g. azathioprine, ciclosporin,mycophenolate |
| **Haematology** | Iron eg ferrous sulphateVitamin B12 (hydroxocobalamin)Folic acid Vitamin KBlood **▼** | Chemotherapeutic agentsFolinic acid |
| **Infectious diseases** | Anti-bacterials Beta-lactamsPenicillins▼: benzylpenicillin and phenoxymethylpenicillinBroad spectrum penicillins▼: amoxicillin & pivmecillinamPenicillinase-resistant penicillin▼: flucloxacillinBeta lactam-beta-lactamase inhibitor combinations▼: amoxicillin-clavulanic acid and piperacillin- tazobactamCephalosporins: cephalexin, cefuroxime, cefotaxime, ceftriaxone, ceftazidime and ceftarolineNon-beta-lactamsAminoglycosides: gentamicin and amikacinMacrolides: erythromycin, clarithromycin and azithromycinClindamycinGlycopeptides: Vancomycin and TeicoplaninMetronidazoleNitrofurantoinQuinolones: ciprofloxacin and levofloxacinTetracyclines: doxycycline, TigecyclineTrimethoprimAnti-fungalsAzoles: clotrimazole and fluconazole,NystatinAnti-viral agents: aciclovir and valciclovir | Anti-bacterials Beta-lactams Carbapenems: ertapenem, imipenem, meropenem Monobactam: aztreonam Non-beta-lactams Fidaxomycin Fosfomycin Co-trimoxazole Chloramphenicol Fusidic acid Linezolid Mupirocin Antifungals Amphotericin, Echinocandins: anidulafungin Anti-helminthic drugs Anti-leprosy drugs Anti-protozoal drugs including antimalarial drugs Anti-tuberculosis drugs Anti-virals: HIV drugs |
| **Musculoskeletal** | NSAIDs ▼ e.g. ibuprofen, naproxenGlucocorticoids e.g. prednisoloneeMethotrexate▼ | DMARDs**▼** |
|  | Allopurinol | Colchicine Uricosuric agents |
|  | Calcium saltsBisphosphonates e.g. alendronateVitamin D analogues |  |
| **Neurology** | CarbamazepinePhenytoin **▼**Valproate | Other antiepileptic drugs e.g. lamotrigine, levetiracetam |
|  | Levodopa and dopa-decarboxylase inhibitors (co-careldopa, co-beneldopa)Anticholinergic drugs (e.g. procyclidine, trihexyphenidyl) | Other drugs used in Parkinson’s disease (e.g. dopamine receptor agonists, COMT inhibitors, selegiline) |
|  | Triptans e.g. sumatriptan |  |
| **Obstetrics & Gynaecology** | Oral contraceptives**▼**Long acting progestogensIntra-uterine device  | Oxytocic drugsDanazolAntibiotics for PPROM, UTI, post LSCS, third/fourth degree tearsLMWH for prophylaxis and treatment of VTEOral iron supplementationLow dose aspirin for PET prevention and to improve placental circulationLabetalol, methyldopa and nifedipine for hypertension in pregnancySyntometrine® (ergometrine/oxytocin)Constipation medication in pregnancy |
|  | Hormone replacement therapies**▼** |  |
|  |  | Gonadotrophin releasing hormone agonists |
|  | Mefenamic acid and tranexamic acid for HMB | Stress incontinence medication |
|  |  | Topical genital wart home treatments |
| **Oncology** | Basic principles of cancer chemotherapy**▼** | All specific drugs Eg. Cytotoxic agents- Doxorubicin Hormonal cancer treatment- AnastrazoleCell signalling inhibitor- Trastuzamab |
| **Ophthalmology** | Basic principles of using eye dropsDrugs used in glaucomaOcular lubricants e.g. hypromelloseOcular topical antibiotics e.g. chloramphenicol, fuscidic acid | Antimicrobial drugs |
| **Paediatrics** | Basic principles of using drugs in children (BNF-C), including simple analgesia, oxygenBronchodilators and inhaled steroids for asthma (including appropriate delivery)Antimicrobial drugs for suspected meningitis/sepsis **▼**, and for pneumonia, urinary tract infection and (when appropriate) ENT infections.Laxatives appropriate for childrenEmollients and topical steroids for eczemaOral rehydration fluidsMaintenance, rehydration and bolus intravenous fluidsImmunisations | Oral/nebulised steroids for croupImmunisations Cystic fibrosis treatmentInsulinAntiepilepticsDesmopressinUTI prophylaxisCorticosteroids for nephritic syndromeErgocalciferol/ cholicalciferol for rickets |
| **Pain relief and palliative care** | Opioid analgesics▼ (e.g. co-codamol, morphine)ParacetamolNSAIDs ▼e.g. IbuprofenNeuropathic agents e.g. amitriptyline | Other opioid analgesics e.g. oxycodone, fentanyl |
|  | Antiemetics:Dopamine receptor blockers e.g. MetoclopramidePhenothiazine antiemetics e.g. prochlorperazineAntihistamines eg. Cyclizine | DomperidoneHaloperidol5HT3 receptor antagonists e.g. ondansetronLevomepromazine |
|  | End of Life Anticipatory MedicationsAnxiolytic e.g. midazolamAntisecretory e.g. hyoscineAnti-emeticOpioid |  |
| **Psychiatric**  | Benzodiazepines▼e.g. diazepam, temazepamZ drugs e.g. Zopiclone Zolpidem |  |
|  | Tricyclic antidepressants▼ e.g. amitriptylineSSRIs e.g. sertraline, citalopramNaSSA e.g. Mirtazapine | MAOIsSNRIs e.g. Venlafaxine, duloxetine |
|  | Mood stabilizers- Lithium**▼** | Sodium/semisodium valproateLamotrigine |
|  | Anti-dementia drugs:Acetyl Cholinesterase inhibitors e.g. donepezil, galantamine, rivastigmine | Memantine |
|  | Antipsychotic drugsTypical/1st generation e.g. chlorpromazine, haloperidolAtypical/2nd generation e.g. olanzapine, quetiapine, | Other 2nd generation: e.g. risperidone, aripiprazole3rd generation -ClozapineDepot antipsychotic medication |
| Respiratory  | Beta-2 adrenoceptor agonists e.g. salbutamol, salmeterolCompound bronchodilators/steroids e.g. seretide®Anticholinergic drugs e.g. ipratropium, tiotropiumXanthines e.g. theophyllineCorticosteroids▼e.g. beclometasoneOxygenMucolytics e.g. Carbocisteine | Leukotriene receptor antagonists e.g. montelukastCromones (cromoglicate) |
| **Urinary tract** | Alpha-adrenoceptor antagonists e.g. tamsulosinPhosphodiesterase type-5 inhibitors e.g. sildenafil Antimuscarinic drugs e.g. oxybutynin, tolterodine | GnRH analoguesFinasterideFlutamide, bicalutamide |
| **Self-poisoning** | General managementActivated charcoal (single and repeated doses)N-acetylcysteine | Specific antidotes |

**Drug Profile sheet**

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