### C:\Users\mike.gilbert\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\Q77N02HJ\Dartford Gravesham and Swanley CCG col.jpg MONITORING DRUG THERAPY

**This guidance is intended as a quick reference only. For further details prescribers should refer to the latest BNF or the individual SPC (Summary of Product Characteristics) available on www.medicines.org.uk or any relevant local guidance.**

**It is suggested that before commencement of all therapies BP, weight, height and smoking status are recorded and additional tests considered if appropriate e.g. HbA1c, lipids etc. as well as the tests recommended below. The continued monitoring of weight and empowering positive lifestyle choices at the subsequent reviews (especially annual) is also essential.
 Abbreviations: BG (Blood Glucose), BP (Blood Pressure), CPK (Creatine Phosphokinase), CRP (C Reactive Protein), CXR (Chest X-Ray), ECG (Electrocardiogram), ESR (Erythrocyte Sedimentation Rate), FBC (Full Blood Count), INR (International Normalised Ratio), LFT’s (Liver Function Tests), P(Pulse), RFT’s(Renal Function Tests, UE (Urine&Electrolytes),TFT’s (Thyroid Function Tests), Tx (Drug treatment), Urine**

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|  Drug | **Tests before therapy** | **Tests during therapy** | **Frequency** | Notes on Frequency | Drug**Levels** | Notes |
| **Aminosalicylates e.g. Mesalazine, Sulfasalazine etc.** | FBC,UE,LFT | FBC,UE,LFT | 3m | monthly for first 3 months, then 3 monthly, 1st year, then 6 monthly thereafter, more frequent if required, if blood dyscrasia suspected then bloods should be reviewed immediately. |  | Blood dyscrasias rare- patient should report unexplained symptoms as explained in the sulfasalazine notes at the bottom of the page. |
| **ACE inhibitors** | UE | UE | <14d then 6m | 7-14 days after starting Tx or changing doses, then at least annually. Otherwise as per notes |   | Monitor more frequently in high-risk patients, e.g. unstable heart failure, reca2+nal impairment, or if doses changing.  |
| **Amiodarone** | TFT,LFT,UE, CXR,ECG | TFT,LFT,UE, CXR | 6m | Every 6 months and several months after stopping, CXR during treatment if dyspnoea, cough or pleurisy develop. |   | SPC also recommends K+and ECG periodically, ophthalmological examination annually, more frequently if blurred or decrease in vision occurs. If pulmonary toxicity suspected CXR and lung function tests. |
| **Antidepressants** | UE, LFT, FBC  | UE, FBC, LFT,ECG for venlafaxine | 12m | Annually. If hyponatraemia suspected (can cause SIADH).Specialist supervision required for patients on venlafaxine doses of 300mg or more daily |   | Patients may develop drowsiness, confusion or convulsions. Balance risks & benefits for treating individuals younger than 18 years of age monitor for suicidal behaviour, self-harm or hostility |
| **Atypical Antipsychotics** | FBC,UE,LFT,CPK,LIPIDS,BG, HBA1C,prolactin | FBC,UE,LFT, CPK,LIPID,BG, HBA1C, prolactin, wt. | 4m then 12m | Wt., 4 monthly then annually, |   | They should be used with care if prescribed with other drugs that increase the QT interval. Should be used with caution in patients with CV disease or a history of epilepsy and with great caution in the elderly (review treatment regularly). Side effects: wt. gain, dizziness, postural hypotension, syncope, extrapyramidal symptoms (respond to dose reduction or to an antimuscarinic drug) and occasionally tardive dyskinesia on long-term administration (discontinue on appearance of early signs). |
| **Azathioprine** | FBC, UE, LFT | FBC, LFT | 7d for 8w then 3m | FBC weekly for 1st 8 weeks then every 1-3 months.  |   | Patients should report bruising, bleeding, fever etc. LFT’s monthly until dose stable. |
| **Carbamazepine** | FBC,LFT,UE, Bone profile, | FBC,LFT,UE, Bone profile | 3m then 6m | Tests repeated 6 monthly thereafter | Often | Check pre-dose trough level if continuing seizures or toxicity suspected or to check compliance. Counsel pts on awareness of possible blood, liver or skin disorders. Patient to report any unexplained illness\* e.g. diplopia, dizziness, fever, stomatitis, sore throat |
| **Carbimazole** | LFT,FBC,TFT | LFT, FBC, TFT | 6m | LFT’s during 1st 6 months. |   | Patients should report symptoms of sore throat, mouth ulcers, bruising, bleeding, fever, etc. Patients to report signs of jaundice. |
| **Chlorpromazine** | FBC | FBC | 12m | If unexplained infection or fever. |   |   |
| **Ciclosporin** | FBC,UE, LFT, LIPIDS | FBC,UE, LFT, LIPIDS | 14d for 12w then 1m for 3m then 3m. LIPIDS 6m | UE, BP 2 weekly until dose stable for 3 months. (2 weekly again if dose is changed) then monthly. FBC and LFT’s monthly until dose stable for 3 months and then 3 monthly. Blood Lipids 6 monthly. | Trough varies with indication | Check trough level if adding or stopping drug known to affect ciclosporin levels. Avoid high dietary potassium. Prescribe and dispense by brand name. |
| **Cyproterone** | FBC, LFT | FBC, LFT | 6m | FBC 6 monthly. LFT’s if signs/ symptoms develop. |   | Patients should report possible signs of hepatotoxicity. |
| **Dementia drugs** | FBC,UE, B12 + Folate, BG, TFT, LFT, ECG | FBC,UE,TFT,LFT | 6m  | Assess 6-12 months. (Specialist input necessary)  |   | \*See NICE TA 217 (Alzheimer’s disease) |
| **Digoxin** | UE,TFT | UE, Digoxin level | 6m | UE 6 monthly if stable. Digoxin level Periodically, e.g. at annual review. Maintain K+ at 4-5 mmol/L ideally (caution with diuretics and ACE-inhibitors). Pre-existing or suspected thyroid disease- myocardial sensitivity to digoxin may be altered. | Not routine | Stop drug if toxicity suspected. Consider digoxin levels in certain circumstances, e.g. uncontrolled rate, if toxicity suspected, to check compliance, in heart failure with sinus rhythm, if renal function changing, etc. Measure level at least 6 hrs post dose.  |
| **Diuretics** | UE | UE | 6m | Periodically, e.g. at annual review or more often if clinically unstable or dose changing. |   | Metolazone - more frequent monitoring. Thiazides - urinalysis for glucose before Tx and annually. |
| **Glitazones** | LFT | LFT | 2m then 6m | 2 months then 6 monthly at higher clinical risk. |   | Avoid in heart failure. Patients to report signs of jaundice and fluid retention. |
| **Hydroxychloroquine** | UE, LFT, FBC & Eye Test | FBC, ESR, UE, LFT | 6m. Eye check 12m | Every 6 months. Eye examinations must be repeated at least every 12 months. |   | Patients should report visual changes. Enquire about other side effects as for Penicillamine |
| **Leflunomide** | FBC,LFT | LFT, BP, FBC | 2w for 6m then 2m |   |   | Specialist input advised |
| **Levothyroxine** | TFT, ECG | TFT | 3 m then 6m then 12m if stable | Annually once stable. |   | Caution in cardiovascular disease. |
| **Lithium** | FBC, LFT,Bone Profile, UE, TFT, ECG | TFT,UE,Bone Profile,FBC,LFT | 3m then 6m | Annual Ca2+ (Watch for hypercalcaemia), RFT & TFT 6 monthly. Monitor Wt. if rapid weights gain. | After 4-5 (<7) days initially | Weekly lithium levels until constant for 4 weeks, then normally every 3 months. Measure drug level at least 12 hours post-dose or a trough level if taken as a twice daily dose (i.e. before next dose). |
| **Methotrexate** | FBC,LFT,UE CXR | FBC,UE,LFT | 1w until stable dose then < 3m | Weekly until stabilised. Monitor 2-3 monthly |   | SPC suggests FBC, Urine, RFT’s & LFT’s every 2-3 months. This monitoring would also apply to patients taking methotrexate for GI and skin conditions. |
| **Minocycline** | None | FBC, UE, LFT 3monthly review | 3m then 6m | Advised if Tx continues for longer than 6 months. |   | Check for signs/symptoms of hepatotoxicity or Systemic Lupus Erythematosus (SLE) pigmentation. |
| **Mycophenolate** | FBC | FBC | 7d for 4w then 2w for 8w then 1m | FBC weekly for 4 wks, then twice monthly for 2 months then every month in 1st year. |   | Patients should report bruising, bleeding, fever etc. |
| **NOACs (Apixaban, Dabigatran, Edoxaban, Rivaroxaban)** | COAG screen, LFT, FBC, UE | UE,LFT,FBC | 12m | Annually or more frequent if indicated |   | U& E’s, LFTs, FBC at least once a year especially in elderly and patients with renal impairment. Repeat U&Es more frequently in patients over 75 years or established renal impairment. Frequently assess compliance and reinforce advice regarding regular dosing schedule. Advise patient to report optical or gastric bleeds |
| **Oxcarbazepine** | UE | UE |   | See SPC- only some patients included. | No | Counsel pts on awareness of possible blood, liver or skin disorders. |
| **Penicillamine** | FBC,UE, ESR, CRP, LFT, proteinuria | FBC,UE, ESR, CRP, LFT, proteinuria | 2w for 2m then 1m | FBC, RFT’s every 2 weeks for 2 month, then monthly. Annual RFT’s, LFT’s. Patient can do weekly urinalysis.  |   | Taste disturbance can be ignored unless distressing when dose reduction may be needed. Be vigilant for - sore throat, fever, infection, unexplained bleeding & bruising, purpura, mouth ulcers or rashes. Specialist input advised |
| **Phenytoin** | FBC, LFT | FBC, LFT, B12 &folate | 6m | FBC,LFT.B12 & Folate 6 monthly | Often Useful | As for carbamazepine. Check pre-dose trough if level required. |
| **Propylthiouracil** | LFT,FBC,TFT | LFT, FBC, TFT | 6m | LFT’s during 1st 6 months. |   | Patients should report symptoms of sore throat, mouth ulcers, bruising, bleeding, fever, etc. Patients to report signs of jaundice. |
| **Sodium aurothiomalate**  | FBC ,proteinuria ,UE, LFT | FBC ,proteinuria ,UE, LFT |   | Before each injection |   | Specialist advice should be sought if necessary. |
| **Statins** | LIPIDS,LFT, TFT,CPK | LIPIDS,LFT ,CPK | 3m then 12m | LIPIDS, LFT 3 monthly when dose titrating, then annually. CPK in ‘high risk’- with muscle disorders, renal impairment, hypothyroidism, alcohol abuse, fibrates, ciclosporin and some anti-infectives. |   | LFT’s sooner if hepatotoxicity suspected. If titrating to 80mg simvastatin-additional LFT’s after 3 months. Long term LFT’s in atorvastatin SPC. Check CPK if myalgic symptoms develop. Pts must be warned to be aware of pain, tenderness or weakness, malaise, fever or dark urine, especially in early stages of Tx and after dose increases. Dose increases at intervals of at least 4 weeks. |
| **Tacrolimus** | FBC,UE,LFT.BG, ECG | FBC,UE,LFT.BG, ECG | 14d for 12w then 1m for 3m then 3m. LIPIDS 6m | (N.B. Echocardiograms are recommended before treatment) |   | 3 different formulations- not safe to switch between them. Immediate release capsules: Prograf (generic form OK) and Adoport dose bd. Prolonged -release capsules: Advagraf dose od. Granules: Modigraf dose bd. Prescribe with full information |
| **Theophylline etc** | UE, LFT | Drug levels, UE LFT | 12m | Use to check therapeutic levels or suspected toxicity | Useful  | Measure pre-dose trough and/or 8-12 hours post-dose peak. |
| **Valproate** | LFT,FBC,UE, Coag screen | LFT, FBC | 6m | LFT’s monthly for 6 months, then annually. FBC/Coag screen before surgery. |   | Blood levels not clinically useful. May be of limited use to check compliance. Bleeding time and coagulation tests to ensure no potential for complications. |
| **Vitamin D** | See CCG Vit D guidance | Bone Profile |   | serum Ca should be checked 1 month after completing loading regimen in patients being treated for deficiency. |   | Refer to CCG Vitamin D prescribing Guidelines |
| **Warfarin** | COAG screen, FBC, LFT | INR as required, FBC, LFT annually | as per INR star | Daily or alternate days initially, then at longer intervals (depending on response). At least every 12 weeks on long-term Tx. And within a week if patients treated with antibiotics or new medicines known to interact with warfarin |   | INR should be monitored more frequently in patients at risk of over coagulation e.g. patients with severe hypertension, liver, renal disease or have current illness, adherence problems, have major dietary/ alcohol changes or taking drugs. Refer to the BNF when adding or stopping a drug (as they may interact. Repeat INR one week afterwards) N.B.INR Star does not take illness into consideration. |