Suggested Guidance on Monitoring Drugs in Primary Care March 2019

The aim of this guidance is to provide suggestions on the monitoring requirements for high risk drugs in several therapeutic areas. The list of drugs is not exhaustive and information should be used in conjunction with any local policies already in place. The information does not address whether the monitoring should be carried out in primary or secondary care. However links have been provided to local Shared Care prescribing Agreements where available which clarify responsibilities.

DRUG	TESTS BEFORE THERAPY	SERUM DRUG LEVELS		TESTS DURING THERAPY		NOTES
		RANGE	FREQUENCY	TEST	FREQUENCY	
ACEIs & ARBs See BNF for more detail regarding initiation in patients with hyponatraemia, hypovolaemia, severe or unstable heart failure, known renovascular disease, is hypotensive or taking multiple or high-dose diuretics or high-dose vasodilators. See local CV Formulary for recommended options	U&E, creatinine, eGFR, (esp if CKD), BP. **Hypertension:** Seek further advice if serum Cr >200micromol/L or eGFR < 30ml/min, or confirmed renovascular disease before initiating treatment. **CKD:** ACEI/ARB therapy should not normally be started if the pre-treatment serum potassium is >5.0mmol/L.			BP, U&E, Creatinine:	Generally, 7-14 days after dose changes and then periodically, especially after dose increments. Also, for use in - **Heart Failure:** every 3 months and more frequently in patients taking combined loop and thiazide diuretic therapy and in those taking aldosterone antagonists. Monitor BP routinely. **Hypertension:** NICE guidance for resistant hypertension (step 4) suggests monitor blood sodium and potassium and renal function within 1 month and repeat as required thereafter. CKS advice: check electrolytes and renal function at least annually in stable patients (non- diabetic). **CKD:** In patients with CKD not due to diabetes, check BP every 3–6 months; urea and electrolytes, and eGFR, at least every 12 months **Post-MI:** Serum creatinine, electrolytes and BP at least annually.	Combined use of ACEIs and ARBs not routinely recommended. Monitor potassium levels if used with an aldosterone antagonist / potassium-sparing diuretic. See also local guidance – KMB 1 & KMB 2 and CV Formulary See also Think Kidneys Guidelines regarding medicines optimisation during Acute Kidney Injury (AKI).

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ADHD CNS Stimulant Treatments See Shared Care Agreement for Stimulants in ADHD See Shared Care Agreement for Atomoxetine See Shared Care Agreement for Adults with ADHD	**Children & adolescents:** Baseline height, weight, auscultation of heart, BP and pulse rate **Adults:** Baseline BP and pulse rate			**Children & adolescents:** Height, weight, BP and pulse rate: **Adults:** BP, Pulse and weight:	6 monthly – may be shared between specialist service's annual clinic appointments and the GP's annual appointments as required at specialist appointments	At least yearly review of diagnosis/need for continuation of medication. The young person can "grow out" of ADHD, secondary to neuro-developmental maturation or changes in circumstances.
Amiodarone Manufacturer's SPC available * Amiodarone has a long elimination $t_{1/2}$ – it is only ever given **once daily** after the loading regimen is complete.	Drug initiated by hospital - Thyroid Function Tests, Chest x-ray, LFTs, U&E, ECG			Thyroid function (TSH), LFTs, U&E: Ophthalmological examination: Corneal micro-deposits may develop in some patients. ECG:	Every 6 months (re TSH - for up to 12 months after stopping amiodarone) Annual monitoring check via an optician. * If blurred or decreased vision occurs, complete ophthalmologic examination including fundoscopy should be promptly performed. Appearance of optic neuropathy and/or optic neuritis requires amiodarone withdrawal due to the potential progression to blindness. Unless blurred or decreased vision occurs, ophthalmological examination is recommended annually. Periodically – suggested every 12 months	Drug initiated by hospital. If pulmonary toxicity suspected, chest x-ray & lung function tests required If added to maintenance digoxin, halve the digoxin dose. In warfarinised patients, more frequent monitoring of INR both during and after amiodarone treatment is recommended1; initially weekly for first 7 weeks See also local CV Formulary
Antipsychotics atypical or typical, oral or depot	U&E, LFTs, fasting lipids, HbA1c, FBC, thyroid function Weight, BMI, waist circumference BP, pulse, ECG if have risk factor for QT prolongation, EPSE			U&E, FBC, thyroid function, fasting lipids, HbA1c, weight, BMI, waist circumference, LFTs, EPSE: BP / pulse: Thyroid function:	10-16 weeks, 6 months, 12 months then annually During titration; p.r.n. clinically As required clinically	Check prolactin and CPK as required clinically. Check smoking status. Consider ECG if have additional risk factors for QT prolongation See also local Mental Health Drugs Formulary

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Apixaban Manufacturer's SPC available	Renal function, LFTs Baseline clotting screen FBC Body weight, BP			Assess compliance and reinforce advice to take regularly: Enquire re adverse effects e.g. bleeding: Assess for thromboembolic events. Enquire about other medicines, including Over the Counter meds: **Renal function:** If CrCl>60ml/min - If CrCl 30-60ml/min - If CrCl 15-30ml/min - **LFTs:** **FBC:**	Ideally every 3 months until the patient is stabilised Check annually Check six-monthly Check three-monthly Annually Annually	See also local CV Formulary See also local Oral Anticoagulation Therapy in Atrial Fibrillation pathway See also local NOACs GP / Patient Decision Support Aid If CrCl<15ml/min stop Rx, assess for bleeding and consider alternative anticoagulation therapy. If eGFR is 15-29ml/minute/1.73m^2, or if serum Cr is 133micromol/L and the patient is aged 80 years or older or weighs less than 60kg, reduce dose to 2.5mg BD.
Azathioprine For use in Inflammatory Bowel Disease See Shared Care Agreement for use in IBD	U&E, Creatinine. FBC, LFTs: Baseline, then weekly for 6 weeks, and then every 2 weeks until the dose is stable for 6 weeks. TMPT assay			U&E, creatinine: FBC, LFTs:	Every 6 months Monthly – when dose is stable, can reduce to every 3 months unless TMPT heterozygote. See Shared Care Agreements for local recommendations.	See Shared Care Agreement for use in IBD
Azathioprine See Shared Care Agreement for use in Autoimmune Diseases	Thiopurine methyl transferase (TPMT) level. Weight FBC, ALT and albumin, creatinine and eGFR. Pulmonary function tests and CT scan, where there is co-existing pulmonary disease. Screening for occult viral infections (HIV, hepatitis B and C). Record varicella status			FBC, eGFR, ALT and albumin:	Every 2 weeks, until the patient has been on a stable dose for 6 weeks (Specialist responsibility). GP then to check these parameters every month for 3 months. Where there is a low risk of toxicity, onward monitoring may then be reduced to 3-monthly as a minimum, after discussion with the relevant consultant. Should further dose escalation be required, blood tests are also needed every 2 weeks for 6 weeks, after each dose increase,.	For indications for referral back to the specialist, see Shared Care Agreement for use in Autoimmune Diseases Refn: BSR and BHPR guideline for the prescription and monitoring of non-biologic Disease-Modifying Anti-Rheumatic Drugs – February 2017 Rheumatology (Oxford) (2017) 56 (6): 865-868.

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Biologic agents e.g. adalimumab, certolizumab pegol, etanercept, golimumab, infliximab, rituximab Prescribing and monitoring responsibility rests with Hospital	FBC, U&E, LFTs, ESR, CRP, ANA, chest x-ray			FBC, U&E, LFTs, ESR: Chest x-ray:	3 to 6 monthly If clinically indicated	Periodic examination for non-melanoma skin cancer in patients at increased risk.
Carbamazepine Manufacturer's SPC available	FBC, U&E, LFTs, renal function. HLA-B*1502 status in Thai/Chinese patients. Weight & height if using in ***bipolar disorder***		In ***bipolar disorder*** check plasma levels 2 weeks after initiation, 2 wks after a dose change & every 6-12 months	FBC, U&E, LFTs: Vitamin D levels/ bone metabolism tests in ***epilepsy*** patients: ***In Bipolar disorder –*** FBC, LFT, U&E, TFT & weight: HbA1c, lipid profile (>40 yrs old), BP, weight, height:	Annually Every 2-5 years Every 6 months Every 12 months	Do not check serum drug levels in ***epilepsy*** patients unless assessing adherence or suspected toxicity.
Carbimazole Manufacturer's SPC Specialist Initiation only See also NNUH Guideline for the management of Thyroid Disease	WBC, TFTs TFTs, WBC, LFTs			TFTs: LFTs: WBC:	Every 4-6 weeks after initiation, reduced to every 3 months once maintenance dose is achieved then annually if being used long term. If any signs and symptoms of hepatic disorder, stop carbimazole and perform liver function tests immediately. Check WBC if there is any clinical evidence of infection. Stop carbimazole if there is clinical evidence of neutropenia / if leucocyte count falls to <1500x106/L or neutrophil count to <500x106/L.	Risk of neutropenia and agranulocytosis: Patients should be asked to report symptoms and signs suggestive of infection, especially sore throat. Repeat WBC if patient develops fever, mouth ulcers, sore throat or other symptoms of infection. Stop carbimazole and immediate refer to specialist if laboratory evidence of neutropenia.

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Ciclosporin See local Shared Care Agreement [Drug initiated by hospital] Manufacturers' SPCs available	FBC, eGFR, Blood Glucose, LFTs (ALT) and albumin, BP, Weight ***Gastroenterology*** – magnesium levels	***Gastroenterology use:*** 100-200ng/ml	Weeks 1 and 2 then monthly	***Gastro use:*** FBC, BP, U&E ***Rheum / Derm use:*** FBC, eGFR, ALT and albumin, BP and glucose	Weeks 1 and 2 then monthly. Every 2 weeks, until a stable dose has been achieved for 6 weeks (specialist responsibility). GP then to check these parameters every month for 3 months. Where there is a low risk of toxicity, onward monitoring may then be reduced to 3-monthly as a minimum, after discussion with the relevant consultant. Indications for withholding treatment and referring back to the specialist are listed in the local Shared Care Agreement.	Check trough level if adding or stopping drug that will affect ciclosporin levels – check BNF for potential drug interactions. Avoid high dietary potassium. Refn: BSR and BHPR guideline for the prescription and monitoring of non-biologic Disease-Modifying Anti-Rheumatic Drugs – February 2017 Rheumatology (Oxford) (2017) 56 (6): 865-868.
Clozapine Manufacturer's SPC available Prescribing and monitoring responsibility rests with the Norfolk and Suffolk Foundation Trust Therapeutic Drug Monitoring service, apart from the Annual Health Check which the GP provides.	Fasting lipids, HbA1c, LFTs, weight, BMI, waist circumference, U&E, BP, FBC, pulse, ECG, thyroid function		Check serum levels as clinically required to assess dose and adherence	Fasting lipids, HbA1c, LFT, U&E weight, BMI, waist circumference: FBC: BP/ Pulse:	10-16 weeks, 6 months, 12 months then annually. Annual health check undertaken by GP. Weekly for 18 weeks, then every 2 weeks for 34 weeks, then monthly. During titration, weekly for 18 weeks, then monthly.	If history of seizures check EEG; monitor as clinically required. Check prolactin and CPK as required clinically. See also local Mental Health Drugs Formulary

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Corticosteroids (long term oral therapy) Check if increased risk of osteoporosis (in line with NICE CG 146). Risk assessment tools may underestimate fracture risk if a person is taking high-dose oral or high-dose systemic glucocorticoids (more than 7.5mg prednisolone or equivalent per day for 3 months or longer)	BP / Body weight / BMI Height (children & adolescents) Ophthalmic examination (consider advising to see optician for baseline assessment) HbA1c Triglycerides Potassium Assess for risk factors or pre-existing conditions that may potentially be exacerbated by steroids, i.e. diabetes, dyslipidaemia, CVD, GI disorders, affective disorders, or osteoporosis DEXA scan for people aged <65years with no previous fragility fracture who are due to start a course likely to last ≥3months. Consider starting treatment if there is a long wait for DEXA scanning.			Triglycerides & potassium: HbA1c to check for new onset diabetes if patients become symptomatic: Following risk assessment with FRAX (without a BMD value) or QFracture, consider measuring BMD with DXA in people whose fracture risk is in the region of an intervention threshold for a proposed treatment, and recalculate absolute risk using FRAX with the BMD value. BP: Triglycerides & potassium:	1 month after start of therapy At least 3 months after start of therapy. **Do not routinely measure** BMD to assess fracture risk without prior assessment using FRAX (without a BMD value) or QFracture. Monitor regularly – every appointment Every 6 – 12 months	Screen for diabetes mellitus regularly Sick Day Rules for patients taking long-term replacement steroid therapy (Hydrocortisone or Prednisolone), is available
Dabigatran Manufacturer's SPC available	Baseline clotting screen U&Es, LFTs, FBC BP			Assess compliance and reinforce advice to take regularly: Enquire re adverse effects e.g. bleeding: Assess for thromboembolic events. Enquire about other medicines, including Over the Counter meds: **U&Es, LFTs, FBC:** If CrCl 30-60ml/min, patient >75 years or fragile, repeat U&Es: If CrCl 15-30ml/min, repeat U&Es:	Ideally every 3 months until the patient is stabilised At least annually, especially in elderly those with renal impairment Every 6 months Every 3 months	See also local CV Formulary See also local Oral Anticoagulation Therapy in Atrial Fibrillation pathway See also local NOACs GP / Patient Decision Support Aid If renal function declines, review as dabigatran may need to be stopped or a lower dose may be required.

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Denosumab **(60mg 6-monthly subcutaneous dose for osteoporosis)** Manufacturer's SPC available See also Shared Care Agreement	**Risk of hypocalcaemia:** Plasma-calcium concentration monitoring is recommended before each dose and two weeks after the initial dose in patients with risk factors for hypocalcaemia. **Minimising the risk of osteonecrosis of the jaw:** A dental examination and appropriate preventative dentistry are recommended for patients with risk factors for ONJ: smoking, old age, poor oral hygiene, invasive dental procedures, comorbidity (including dental disease, anaemia, coagulopathy, infection), advanced cancer, previous treatment with bisphosphonates, and concomitant treatments (including chemotherapy, antiangiogenic biologics, corticosteroids, and radiotherapy to head and neck). All patients should be given a patient reminder card and informed of the risk of ONJ. Ask patients if they have any problems with their mouth or teeth before starting treatment. If worn, dentures should fit properly before starting treatment. Patients should practise good oral hygiene, and have dental check-ups during treatment. Patients should immediately report any oral symptoms such as dental mobility, pain, swelling, non-healing sores or discharge to a doctor and dentist. Patients should tell their doctor and dentist that they are receiving denosumab if they need dental treatment or surgery.			Plasma-calcium concentration monitoring is recommended:	• within two weeks after the initial dose in patients with risk factors for hypocalcaemia (e.g. severe renal impairment, creatinine clearance less than 30 mL/minute) • before each dose is administered • if suspected symptoms of hypocalcaemia occur before each 6–monthly dose	Patients should be advised to report symptoms of hypocalcaemia (muscle spasms, twitches, cramps, numbness or tingling in the fingers, toes, or around the mouth) Risk atypical femoral fracture (rare): Patients should be advised to report any new or unusual thigh, hip, or groin pain during treatment with denosumab, especially if been on treatment for ≥2.5 years. See also Shared Care Agreement
Digoxin Manufacturer's SPC available	U&E, renal function Consider thyroid status: Initial and maintenance doses of digoxin should be reduced when thyroid function is subnormal. In hyperthyroidism there is relative digoxin resistance and the dose may have to be increased.		Check levels 8-10 days after dose change (blood sample to be taken *at least* 6 hours after the last dose taken)	U&E, creatinine: BP, Pulse: TFTs:	At least annually, especially for patients on diuretics; ACEIs/ARBs. Recheck 7 to 14 days after changes to co-medication. Hypokalaemia increases risk of toxicity. As appropriate at each appointment. If symptomatic of abnormal thyroid function or started on amiodarone. Adjust digoxin dose as appropriate.	Routine serum level monitoring not recommended. See BNF for clinically significant drug interactions with digoxin

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Diuretics: **Loops** **Thiazides** **Potassium-sparing / Aldosterone antagonists** (see also separate entries)	U&E, glucose urinalysis			***Heart failure*** - U&E, creatinine ***Hypertension*** - U&E HbA1c (Thiazides)	Within 1 week after starting and 1-2 weeks after dose increases. Check every 3-6 months in stable high risk patients & annually in low risk patients. Check 4-6 weeks after initiation and annually thereafter. Check after at least 3 months then annually	Thiazides may induce diabetes mellitus. Avoid co-use of potassium-sparing diuretics / aldosterone antagonists with potassium supplements, and monitor potassium regularly if used with an ACEI or an ARB in heart failure. See also Think Kidneys Guidelines regarding medicines optimisation during Acute Kidney Injury (AKI).
Dronedarone Manufacturer's SPC available See also Shared Care Agreement	ECG, Renal function (plasma Cr), U&E, LFTs [Drug initiated by hospital]			U&E: LFTs: Renal function: Cardiac:	Repeated 7 days after initiation. At one week and at one month following initiation of treatment. Repeated on a monthly basis for 6 months, and at months 9 and 12, and periodically thereafter. Check plasma Cr 7 days after initiation. Up to 10% increase in Cr is expected, unrelated to actual renal dysfunction. If >10% rise, repeat test after a further 7 days. Discontinue Rx if further rises in serum Cr are seen. Monitor renal function periodically whilst on dronedarone. 6-monthly ECGs	See also Shared Care Agreement If pulmonary toxicity is suspected, chest x-ray & lung function tests – treatment to be discontinued if interstitial lung disease confirmed.
Edoxaban Manufacturer's SPC available	Renal function, LFTs Baseline clotting screen FBC Body weight, BP			Assess compliance and reinforce advice to take regularly. Enquire re adverse effects e.g. bleeding. Assess for thromboembolic events. Enquire about other medicines, including Over the Counter meds. **Renal function:** If CrCl > 50ml/min - If CrCl 15-50ml/min - If CrCl < 15ml/min - **LFTs:** **FBC:**	Ideally every 3 months until the patient is stabilised Check annually (60mg dose ok) Check six-monthly (30mg dose ok) Check three-monthly (do not use) Annually Annually	See also local CV Formulary See also local Oral Anticoagulation Therapy in Atrial Fibrillation pathway See also local NOACs GP / Patient Decision Support Aid If renal function declines, review as edoxaban may need to be stopped or a lower dose may be required.

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Eplerenone - Aldosterone antagonists Manufacturer's SPC available	U&E, Renal function, BP			U&E, Renal function, BP:	1 week after any dose increase. In CHF, once the target, or maximum tolerated dose is reached, monitor monthly for 3 months and then at least every 6 months, and at any time the person becomes acutely unwell.	NICE NG 106: Chronic heart failure in adults: diagnosis and management Summaries: Diagnosis of CHF Management of CHF See also Think Kidneys Guidelines regarding medicines optimisation during Acute Kidney Injury (AKI).
Gold (sodium aurothiomalate IM / auranofin (oral) – *discontinued in December 2009 therefore no current UK marketing authorisation – unlicensed preparation*) Manufacturer's SPC available	FBC, Creatinine / calculated GFR, ALT and/or ALT and albumin			FBC, eGFR, ALT and albumin: Urinalysis for blood and protein: Updated in line with **BSR/BHPR guidance February 2017**	Every 2 weeks until a stable dose has been achieved for 6 weeks (specialist responsibility). GP then to check these parameters every month for 3 months. Where there is a low risk of toxicity, monitoring may then be reduced to a minimum of 3-monthly, but only after discussion with the relevant consultant. Prior to each dose (long-term exposure to gold salts is associated with a risk of nephrotoxicity in up to 10% of patients. Renal toxicity usually manifests with an insidious development of proteinuria that is reversible with withdrawal of therapy)	Rashes with pruritus often occur after 2 to 6 months of treatment and may necessitate discontinuation. Ask each time about presence of skin rash or mouth ulcers. Discontinue treatment if blood disorders, gastro-intestinal bleeding (a/w ulcerative enterocolitis), or unexplained proteinuria (a/w immune complex nephritis) which is repeatedly above 300mg/litre present.
Hydroxycarbamide (Hydroxyurea) Manufacturer's SPC available See Shared Care Agreement	FBC, U&E, LFTs [Drug initiated and monitored by hospital]			FBC: Serum creatinine, Uric Acid & LFTs:	Once weekly for first 6 weeks, increase interval if no cause for concern, usual max interval is 3 months although if condition is stable may be up to 4 months. Monitor periodically	Examine for malignancy 6 monthly. Females should attend routine cervical smears

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Hydroxychloroquine Manufacturer's SPC available	Height, Weight, BP FBC, U&E, GFR, ALT and/or AST, Visual Acuity / impairment Ask about visual impairment not corrected by glasses. Record near visual acuity of each eye (with reading glasses if worn) using a test type or reading chart If abnormality is detected refer first to an optometrist			Visual acuity	Patient to seek an annual monitoring check via an optician. The examination should include testing visual acuity, careful ophthalmoscopy, fundoscopy, central visual field testing with a red target, and colour vision.	Patients should be advised to report any visual disturbances. Discuss with ophthalmologist if on treatment for >5 years.
Leflunomide See Shared Care Agreement [Drug initiated by hospital]	FBC, LFTs (ALT and albumin), Creatinine - GFR Body weight BP (need 2 readings, 2 weeks apart)			FBC, eGFR, LFTs (ALT and albumin): BP: Body weight:	Every 2 weeks until a stable dose has been achieved for 6 weeks (specialist responsibility). GP then to check these parameters every month for 3 months. Where there is a low risk of toxicity, monitoring may then be reduced to a minimum of 3-monthly, but only after discussion with the relevant consultant. If co-prescribed with another immunosuppressant or potentially hepatotoxic drug, including methotrexate, continue checks at least once a month long term. Check at each monitoring visit. If BP >140/90mmHg, treat as per NICE Guidance. If still uncontrolled stop. Check at each monitoring visit – if >10% weight loss with no other identified cause, reduce dose or stop and consider washout.	Adverse reactions may require stopping treatment and a washout regimen. For further information on indications for withholding treatment and referring back to the specialist see the local Shared Care Agreement Refn: BSR and BHPR guideline for the prescription and monitoring of non-biologic Disease-Modifying Anti-Rheumatic Drugs – February 2017 Rheumatology (Oxford) (2017) 56 (6): 865-868.

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Lithium (*prescribe by brand*) Manufacturers' SPCs available Initiation and monitoring of drug levels managed by the Norfolk and Suffolk Foundation Trust Therapeutic Drug Monitoring service	U&E, thyroid function, weight, height, BP, lipid profile, HbA1c. Cardiac function/ECG & FBC if clinically indicated. [Drug initiated by hospital]	0.5 - 1.0 mmol/L but lower or higher levels (from 0.4mmol/L up to 1.2mmol/L) may suit individuals	After 4-7 days, then weekly until dose is constant for 4 weeks, then every 2-3 months	Thyroid function, U&E, FBC (if clinically indicated), body weight Calcium, HbA1c, BP, lipid profile (if >40 yrs)	Every 3-6 months Annually	Measure drug level 12 hours after dose Monitoring managed by the Norfolk and Suffolk Foundation Trust Therapeutic Drug Monitoring service **Prescribe by brand to ensure consistent supply of the required formulation**
Melatonin (*Circadin*®) Manufacturer's SPC available See Shared Care Agreement	**Sleep disorders in children:** Height, weight			Height, weight, pubertal maturation progress and seizure frequency in epileptic patients: Assess continued need for treatment:	Regularly, at specialist appointments Every 6 months	See Shared Care Agreement
Mercaptopurine Manufacturers' SPCs available See Shared Care Agreement [Drug initiated by hospital]	U&Es, creatinine FBC, LFTs TPMT assay Screening for hepatitis B and C in patients at increased risk of infection Baseline HIV status should be established in those with risk factors			FBC, LFTs: U&E: FBC, LFTs:	Every 2 weeks for the first 8 weeks of treatment (specialist responsibility) Every 6 months or more frequently if there is any reason to suspect deteriorating renal function. Every 3 months	See Shared Care Agreement
Mesalazine Manufacturers' SPCs available	U&E, LFTs, serum Creatinine			U&E, serum Creatinine: LFTs:	Every 3 months for the first year in elderly patients; every 6 months for the next 4 years; then annually. every 6 months or annually based on the person's risk factors	Monitor renal function if pre-existing renal impairment, co-morbid diseases or nephrotoxic drugs. AST, ALT > twice upper limit of reference range, withhold treatment until discussed with the specialist.
Methotrexate See Shared Care Agreement [Drug initiated by hospital] Manufacturers' SPCs available	FBC, ALT and albumin, and eGFR Assess risk of co-morbid pulmonary disease and baseline investigations as needed. Varicella status to be recorded. ***Dermatology:*** May also			FBC, eGFR, ALT and albumin:	Every 2 weeks until a stable dose has been achieved for 6 weeks (specialist responsibility). Then test monthly for at least 3 months; where there is a low risk of toxicity, monitoring may be then be reduced to 3-monthly as a minimum, following discussion with the appropriate specialist (GP responsibility). Patients also on other DMARDs	For further information on indications for withholding treatment and referring back to the specialist - See Shared Care Agreement Blood tests for children <10yrs will normally be done at the NNUH. Local phlebotomy may be arranged for family

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	check Procollagen 3 peptide				should have on-going monthly monitoring. Repeat tests after adding or removing an interacting drug. Avoid co-use of trimethoprim or co-trimoxazole.	convenience, and usually for older children. Refn: BSR and BHPR guideline for the prescription and monitoring of non-biologic Disease-Modifying Anti-Rheumatic Drugs – February 2017 Rheumatology (Oxford) (2017) 56 (6): 865-868.
Minocycline Manufacturers' SPCs available ***NB* Not recommended for routine use in Norfolk and Waveney**				LFTs:	If treatment longer than 6 months, monitor every 3 months for signs and symptoms of hepatotoxicity, SLE or unusual pigmentation.	Discontinue minocycline if the patient develops signs or symptoms of hepatotoxicity, SLE or unusual pigmentation. ***NB* Not recommended for routine use in Norfolk and Waveney**
Mycophenolate mofetil / Mycophenolic acid: *For use in **adult renal transplantation*** See Shared Care Agreement	FBC, U&E, LFT, MSU (for C&S), BP			See Shared Care Agreement	See Shared Care Agreement	Do ***not*** switch between different mycophenolate salt forms.
Mycophenolate mofetil *For use in **autoimmune conditions*** See local Shared Care Agreement	FBC, LFTs (ALT and albumin), Creatinine / eGFR. Weight and Height. BP Pulmonary function tests / CT assessment if required in those with pre-existing lung disease. Pregnancy testing where appropriate			FBC, eGFR, ALT and albumin:	Every 2 weeks, until a stable dose has been achieved and tolerated for 6 weeks (Specialist responsibility). Then test monthly for at least 3 months; where there is a low risk of toxicity, monitoring may be then be reduced to 3-monthly as a minimum, following discussion with the appropriate specialist (GP responsibility). Patients also on other DMARDs should have on-going monthly monitoring.	For further information on indications for withholding treatment and referral back to the specialist, see local Shared Care Agreement Refn: BSR and BHPR guideline for the prescription and monitoring of non-biologic Disease-Modifying Anti-Rheumatic Drugs – February 2017 Rheumatology (Oxford) (2017) 56 (6): 865-868.

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NSAIDs (including COX-2 inhibitors)	For daily use in patients with risk factors for GI bleeding: baseline haemoglobin or haematocrit. For daily use in patients with risk factors for developing renal insufficiency: baseline creatinine			U&Es: BP (in patients with hypertension): Hb or haematocrit (for daily NSAID use in patients with risk factors for GI bleeding):	Annually in patients with co-morbidities, or as appropriate. Monitor renal function in patients with renal, cardiac or hepatic impairment. Monitor BP 2–4 weeks after starting or increasing dose. Etoricoxib - check BP within 2 weeks of starting and periodically thereafter After one year of treatment	All NSAIDs are contra-indicated in patients with severe heart failure. Diclofenac, celecoxib and etoricoxib are contraindicated in patients with any degree of heart failure. See also local Analgesics Formulary. See also Think Kidneys Guidelines regarding medicines optimisation during Acute Kidney Injury (AKI).
Nitrofurantoin (long term use) See local Antibiotic Formularies Norfolk GY&W:	Contraindicated in: **i)** deficiency of glucose-6-phosphate dehydrogenase or acute porphyria **ii)** acute porphyria **iii) eGFR <45 mL/minute/1.73 m^2** (as there is a risk of peripheral neuropathy and treatment may be ineffective due to inadequate urine concentrations)			Renal function Liver function	As clinically indicated	Monitor closely for pulmonary symptoms, especially in the elderly. Treatment should be discontinued if the person develops unexplained pulmonary, hepatotoxic, haematological, or neurologic syndromes.
Penicillamine Manufacturers' SPCs available	FBC including platelets, U&E and creatinine, urinalysis for protein/blood			FBC, urinalysis for protein / blood:	* Fortnightly for at least the first 2 months of therapy, (or at 1 week after any change in dose) and repeated monthly thereafter.	* In line with former LES for High Risk drugs Ask about skin rash or oral ulceration at every visit.
Phenytoin	LFT, FBC, U&Es, Vitamin D level			FBC: Serum folate: FBC, U&E, LFT, vitamin D levels, tests of bone metabolism:	Check frequently during treatment 6 monthly Every 2-5 years	Do not check serum phenytoin levels in ***epilepsy*** patients unless assessing adherence or suspected toxicity.

DRUG	TESTS BEFORE THERAPY	SERUM DRUG LEVELS		TESTS DURING THERAPY		NOTES
		RANGE	FREQUENCY	TEST	FREQUENCY	
Pioglitazone Manufacturers' SPCs available	LFT, FBC, U&E, body weight			LFT, body weight, HbA1c The risk of fractures should be considered in the long term care of patients treated with pioglitazone (Actos SPC). If pioglitazone is used in combination with insulin patients should be observed for signs and symptoms of heart failure, weight gain, and oedema (MHRA January 2011).	Periodically based on clinical judgement – at least annually or more frequently as necessary. Review the safety and efficacy of pioglitazone in individuals after 3–6 months of treatment to ensure that only patients who are deriving benefit continue to be treated.	**MHRA safety advice:** Use of pioglitazone is associated with a small increased risk of bladder cancer. Pioglitazone should be stopped in patients who do not respond adequately to treatment after 3-6 month (e.g. reduction in HbA1c by at least 0.5 percentage points)
Propylthiouracil Manufacturers' SPCs Specialist Initiation See also NNUH Guideline for the management of Thyroid Disease	TFTs, WBC, LFTs			TFTs: Repeat WBC if patient develops fever, mouth ulcers, sore throat or other symptoms of infection. Stop drug and recommend immediate specialist referral if leucocyte count falls to <1.5x109/L or neutrophil count to <0.5x109/L	Every 1-3 months until stable then annually if being used long term.	Monitor for signs and symptoms of liver injury, especially during the first 6 months after initiation of therapy. Discontinue drug and repeat LFTs if patient develops pruritic rash, jaundice, light coloured stool or dark urine, joint pain, abdominal pain or bloating, anorexia, nausea, or fatigue. Provide supportive care.
Riluzole Manufacturers' SPCs available See also Shared Care Agreement The specialist is responsible for monitoring the clinical progression of the disease.	Baseline blood tests: LFTs & FBC			LFTs & FBC:	Every month for 3 months, then every 3 months for a further 9 months and annually thereafter. More frequent monitoring is advised if the hepatic function is found to be abnormal. Riluzole should be discontinued in the presence of neutropenia or if the ALT level increases to more than 5 times the upper limit of normal.	Because patients taking riluzole are often debilitated it has been agreed that blood forms will be issued by the Hospital Trust and that the results will go back to the specialists for monitoring. This applies to the first 3 months of tests and also all tests thereafter. The phlebotomy service should be provided within Primary Care, as may the prescribing of the medication (after the first 3 months), but the monitoring and issue of the blood test forms should remain within secondary care.

DRUG	TESTS BEFORE THERAPY	SERUM DRUG LEVELS		TESTS DURING THERAPY		NOTES
		RANGE	FREQUENCY	TEST	FREQUENCY	
Rivaroxaban Manufacturer's SPC available	U&Es, CrCl, LFTs Clotting screen, , FBC BP			Assess compliance and reinforce advice to take regularly: Enquire re adverse effects e.g. bleeding: Assess for thromboembolic events. Enquire about other medicines, including Over the Counter meds: **U&Es, LFTs, FBC:** **Renal function:** If CrCl>60ml/min - If CrCl 30-60ml/min - If CrCl 15-30ml/min - **LFTs:** **FBC:**	Ideally every 3 months until the patient is stabilised At least annually, especially in elderly those with renal impairment Check annually Check six-monthly Check three-monthly Annually Annually	See also local CV Formulary See also local Oral Anticoagulation Therapy in Atrial Fibrillation pathway See also local NOACs GP / Patient Decision Support Aid If renal function declines, review as rivaroxaban may need to be stopped or a lower dose may be required.
Sirolimus Manufacturer's SPC available Initiation & monitoring undertaken by the specialist See also Shared Care Agreement	Urea & electrolytes (including calcium & phosphate) Blood pressure LFTs FBC MSU (for Culture & Sensitivities) Lipid screening	Pre-dose ('trough') whole blood-sirolimus concentration (using chromatographic assay) when used with ciclosporin should be 4–12 micrograms/litre (local treatment protocols may differ); After withdrawal of ciclosporin pre-dose whole blood-sirolimus concentration should be 12–20 micrograms/litre (local treatment protocols may differ); Close monitoring of whole blood-sirolimus concentration required if concomitant treatment with potent inducers or inhibitors of metabolism and after discontinuing them, or if ciclosporin dose reduced significantly or stopped. When changing between oral solution and tablets, measurement of whole blood 'trough' sirolimus concentration after 1–2 weeks is recommended.		Urea & electrolytes (including Calcium & Phosphate): BP: LFTs: FBC: Mid-stream urine (for Culture & Sensitivities): Lipid screening:	By the specialist at clinic visits	See also Shared Care Agreement **GP responsibilities:** Identify adverse effects and treat or report to renal physician where appropriate. If a patient presents with a likely infection an urgent FBC and urea & electrolytes should be taken. Alert the specialist to any identified non-compliance with immunosuppressants.

DRUG	TESTS BEFORE THERAPY	SERUM DRUG LEVELS		TESTS DURING THERAPY		NOTES
		RANGE	FREQUENCY	TEST	FREQUENCY	
Sodium valproate / valproate	U&E, LFT, FBC, coagulation tests, bleeding time ***Bipolar disorder*** – weight, height, FBC, LFT, TFT, renal function, lipid profile, HbA1c, BP, ECG (if clinically indicated)			LFT, PT LFT, FBC, weight U&E, LFT, FBC	Periodically within first 6 months At 6 months Every 6 months if using as a ***mood stabiliser***	Do not initiate in primary care for ***bipolar disorder***. Do not check serum levels in ***bipolar disorder*** patients unless assessing adherence or suspected toxicity. Safety advice regarding risks in pregnancy - ***Link***
Spironolactone: Aldosterone antagonists	U&Es (including Cr) and eGFR			***Heart failure:*** U&Es (including Cr)	Weeks 1, 4, 8 & 12; then at 6, 9 and 12 months, then 6 monthly, or otherwise as clinically indicated.	NICE NG 106: Chronic heart failure in adults: diagnosis and management Summaries: Diagnosis of CHF Management of CHF. See also Think Kidneys Guidelines regarding medicines optimisation during Acute Kidney Injury (AKI).
Statins	LFTs, lipid profile, U&E, renal function, Thyroid Function (if not assessed in last year), CPK if pre-disposing factors for rhabdomyolysis present. BP, BMI			LFTs:	Repeated only if clinically indicated. Manufacturers' SPCs available http://www.medicines.org.uk/emc/	Patients starting on a statin, or whose dose is being increased, should be advised of the risk of myopathy and told to report promptly any unexplained muscle pain, tenderness or weakness.

DRUG	TESTS BEFORE THERAPY	SERUM DRUG LEVELS		TESTS DURING THERAPY		NOTES
		RANGE	FREQUENCY	TEST	FREQUENCY	
Sulfasalazine Manufacturer's SPC available See local Shared Care Agreement	FBC, U&Es, LFTs, eGFR Pulmonary function tests / CT assessment if required in those with pre-existing lung disease. Screening for occult viral infections (HIV, hepatitis B and C). Record varicella status.			FBC, eGFR, ALT and albumin:	Every 2 weeks, until the patient has been on a stable dose for 6 weeks (schedule will therefore be: checks at Baseline, 2 weeks, 4 weeks, 6 weeks, 8 weeks, 10 weeks) – Specialist responsibility. Then test monthly for at least 3 months; where there is a low risk of toxicity, monitoring may be then be reduced to 3-monthly following discussion with the appropriate specialist i.e. from 6 months after starting treatment, at 9 months and at 12 months (GP responsibility). Patients also on other DMARDs should have on-going monthly monitoring. Where there is still a low risk of toxicity, monitoring can then cease after 12 months' treatment (at the consultant's discretion).	Ask patients about rash or oral ulceration. For further information on indications for withholding treatment and referral back to the specialist, see local Shared Care Agreement Refn: BSR and BHPR guideline for the prescription and monitoring of non-biologic Disease-Modifying Anti-Rheumatic Drugs – February 2017 Rheumatology (Oxford) (2017) 56 (6): 865-868.
Tacrolimus Manufacturers' SPCs available See also Shared Care Agreement for adult renal transplant See also Shared Care Agreement for use in UC Oral tacrolimus should be prescribed and dispensed by brand name only. Switching between brands requires careful supervision and therapeutic monitoring by an appropriate specialist.	ECG: pre- and post-transplant (e.g. initially at three months and then at 9-12 months) for hypertrophic changes. BP HbA1c U&Es (including calcium & phosphate) LFTs / Renal function tests FBC Blood clotting values Plasma protein measurements.	**Renal transplant** Blood levels: Whole blood trough levels (drawn approximately 12 hours post-dose, just prior to the next dose) should be monitored 2-3 times weekly during the early post-transplant period. Most patients can be successfully managed if blood trough levels are maintained below 20ng/ml. Levels should be monitored periodically during maintenance therapy (especially during episodes of diarrhoea) and checked when any medication with possible interactions is prescribed, the dose or formulation is changed, or when there is unexplained graft dysfunction. **Ulcerative colitis:** The tacrolimus dose will adjusted to achieve a trough level of 5-10ng/ml.		ECG: BP: HbA1c: U&Es (including calcium & phosphate): MSU (for culture & sensitivities) LFTs: FBC: Lipid screening for total cholesterol (annual): Renal function tests:	Post-transplant (e.g. initially at three months and then at 9-12 months) for hypertrophic changes. By the specialist at clinic visits	Patients should be informed that tacrolimus can cause diabetes and should see their clinician if they develop frequent urination, increased thirst or hunger. Excessive exposure to UV and sunlight should be avoided. Patients should cover their skin and use total sunblock (SPF≥50). An annual skin examination by a trained healthcare professional is advised. Renal transplant recipients should receive the pneumococcal vaccine and one booster every five years, and annual influenza vaccine.

DRUG	TESTS BEFORE THERAPY	SERUM DRUG LEVELS		TESTS DURING THERAPY		NOTES
		RANGE	FREQUENCY	TEST	FREQUENCY	
Theophylline Manufacturers' SPCs available	U&Es (esp. potassium) LFTs Smoking status and advise patient to seek advice from doctor if is likely to change.	A level of 10-20mg/litre (55–110 micromol/litre) is required for satisfactory bronchodilation in most people. However 10mg/litre (or less) may be effective if ADRs are experienced at higher levels.	Check the plasma level 5 days after starting oral treatment for the first time. Recheck the plasma level at least 3 days after dose adjustment. Levels should be taken 4-6 hours after MR dose. Sampling times may vary- consult local guidelines.	Recheck plasma theophylline levels: Also check plasma theophylline levels if: Reassess smoking status: Additional monitoring may be required in patients with: Potassium levels: Monitor alcohol consumption:	Every 6-12 months • Side effects experienced that suggest toxicity (nausea, vomiting, tremor or palpitations) • Stop smoking for 7 days or more. Starting smoking may reduce plasma theophylline levels. Stopping smoking may increase plasma theophylline levels. Congestive heart failure, chronic alcoholism, liver dysfunction or with viral infections – risk of reduced theophylline clearance. Periodically in at risk patients High use of alcohol can reduce plasma theophylline levels.	BTS / SIGN Asthma Guideline 2016 advises checking levels during pregnancy as protein binding decreases, the free level of drug will increase, particularly in women with acute severe asthma and in those that are critically dependent on therapeutic theophylline levels. See 12.3.3 at https://www.brit-thoracic.org.uk/document-library/clinical-information/asthma/btssign-asthma-guideline-2016/ (The 2019 Guideline is due to be published in summer 2019.)
(Levo)thyroxine sodium (T4)	TFTs (especially TSH & FT4), ECG			TSH: TFTs:	Check 6-8 weeks after initiation (sooner in elderly especially if have IHD) Annually once stabilised	If the TSH level is below the reference range or is undetectable, titrate the levothyroxine dose down in 25mcg steps until the TSH level is within range (even in people who have an apparent psychological benefit and general feeling of well-being when their TSH concentration is undetectable. Titrating down by 25 micrograms in each instance may make this reduction possible. If the TSH is elevated, titrate the levothyroxine dose up in 25 microgram to 50 microgram increments until within reference range.
Vigabatrin Manufacturer's SPC available	Ophthalmological / visual field examination			Visual field testing: Serum creatinine:	6 monthly Periodically	Visual field defects reported in approx. 1/3 of patients on vigabatrin.

DRUG	TESTS BEFORE THERAPY	SERUM DRUG LEVELS		TESTS DURING THERAPY		NOTES
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Warfarin See also NNUH Guideline for the management of adult patients requiring anticoagulation with warfarin.	PT, APTT, FBC – incl platelet count, LFT, Renal function Thyroid status BP (for HAS-BLED score)			INR:	Daily or on alternate days initially, then longer intervals (depending on response) then up to every 12 weeks.	Repeat INR 1 week after adding or stopping an interacting drug. See also local CV Formulary See also local Oral Anticoagulation Therapy in Atrial Fibrillation pathway

KEY

ACE	angiotensin converting enzyme
ANA	antinuclear antibody
APTT	activated partial thromboplastin time
ARB	angiotensin receptor blocker
BMD	bone mineral density
CRP	C reactive protein
CPK	creatine phosphokinase
EPSE	extra pyramidal side effects
ESR	erythrocyte sedimentation rate
FBC	Full Blood Count = haemoglobin, platelets, red blood cell count haematocrit, mean cell volume, white blood cell count, differential white cell count (neutrophil, lymphocyte, monocyte, eosinophil, basophil)
HbA1c	glycated haemoglobin A1c
LFT	liver function test = alkaline phosphatase, albumin, bilirubin, aspartate transaminase
MSU	mid-stream urine
NSAIDs	non-steroidal anti-inflammatory drugs
PT	prothrombin time
TFT	thyroid function test
TMPT	thiopurine methyltransferase
TSH	thyroid stimulating hormone
U&E	urea, sodium, potassium, creatinine
Urinalysis	blood & protein

Recommendations based on information in the

- **British National Formulary**
- **BSR and BHPR guideline for the prescription and monitoring of non-biologic disease-modifying anti-rheumatic drugs February 2017**
- **the UKMi Suggestions for Drug Monitoring in Adults in Primary Care (October 2017)**
- **and Manufacturers' SPCs**

Where the frequency of monitoring is not specified or periodical monitoring is recommended, prescribers should use their clinical judgement to determine an appropriate interval.

Previous versions prepared by Katie Smith, Director, East Anglia Medicines Information Service
(Originally based on *Suggestions for Drug Monitoring in Adults in Primary Care*: London & South East MI service, South West MI service & Croydon PCT, May 2008)

Version	Date	Author	Status	Comment
1	April 2010	Katie Smith, EAMIS	Guidance	Adopted by the TAG
2	Jul 2010	Katie Smith, EAMIS / TAG	Guidance	Reference to local Shared Care Agreements added

3	Jan 2012	Updated by Fiona Marshall on behalf of the TAG	Guidance	New – Dronedarone; Vitamin D preparations; Amended – Clozapine; Lithium; Logo.
4.1	February 2013	Updated by Fiona Marshall on behalf of the TAG	Draft Guidance – interim version until full review by UKMi is available	New- links to local Shared Care Agreements and to manufacturers' SPCs where appropriate. Revised sections for statins and spironolactone regarding monitoring requirements. Spelling of sulfasalazine
4.2	April 2013	Updated by Fiona Marshall on behalf of the TAG	Draft Guidance – interim version until full review by UKMi is available	**Hyperlinks to local Shared Care Agreements and manufacturers' SPCs updated.** **Amendments recommended by Dr Tarnya Marshall (March 2013):** **Biologic agents:** Chest x-ray – changed from "6 monthly" to "If clinically indicated" **Ciclosporin:** FBC & LFTs "Every 4 weeks for first 3 months, then every 3 months" changed to "Once a month until dose stable and trend stable for 12 months, and then 3 monthly" Corticosteroids: "Repeat BMD (hip & lumbar spine) if baseline measurement done" changed to links to NICE CG 146 and "Following risk assessment with FRAX (without a BMD value) or QFracture, consider measuring BMD with DXA in people whose fracture risk is in the region of an intervention threshold for a proposed treatment, and recalculate absolute risk using FRAX with the BMD value. **Do not routinely measure** BMD to assess fracture risk without prior assessment using FRAX (without a BMD value) or QFracture." **Hydroxychloroquine:** Annual checks via patient's optician in line with manufacturer's SPC (hyperlink inserted). **Methotrexate:** "(pulmonary function if clinically indicated)" removed. FBC, U&E, LFT "Every 2 wks until dose & monitoring stable for 6 weeks, then monthly" changed to "weekly for the first month then monthly" and CRP, ESR: "Every 3 months" changed to "Monthly" "U&E" added to ***"Gastroenterology"*** **Sulfasalazine:** "If stable in first year, reduce to 6 mthly in second yr" removed for FBC, LFTs
4.3	May 2013	Updated by Fiona Marshall on behalf of the TAG	Final Guidance – interim version until full review by UKMi is available	Further amendments recommended at May 2013 TAG meeting and also in line with BSR/BHPR quick reference guideline for DMARD therapy November 2009
5.1	June – July 2016	Updated by Fiona Marshall, TAG Lead Pharmacist, NEL CSU Anglia, on behalf of the TAG	Draft	Key Reference: UKMi Suggestions for Drug Monitoring in Adults in Primary Care (February 2014) Hyperlinks to appropriate BNF sections and manufacturer's SPCs added. Links to local shared care guidelines and prescribing guidance added where available. Ketoconazole removed – no longer available. Safety info re pioglitazone added. New entries: ADHD treatments, D/NOACs (apixaban, dabigatran, edoxaban, rivaroxaban), Denosumab, Melatonin, Propylthiouracil, Riluzole, Sirolimus, Tacrolimus, Theophylline
5.2	August 2016	Updated by Fiona Marshall, TAG Lead Pharmacist, NEL CSU Anglia, on behalf of TAG	Draft	Spelling of vigabatrin corrected. Re-alignment of vertical text to horizontal for easier reading.

5.3	September 2016	Updated by Fiona Marshall, TAG Lead Pharmacist, NEL CSU Anglia, on behalf of TAG	Superseded	TAG recommendations Sep16: Frequency of biologics' monitoring of FBC, U&E, LFTs, ESR changed from monthly to 3-6 monthly. All references to plasma glucose monitoring changed to HbA1c.
6.0	February 2017	Updated by Fiona Marshall, TAG Lead Pharmacist, NEL CSU Anglia, on behalf of Prescribing Reference Group for the TAG	Superseded	Feedback received from Primary Care querying entries for Corticosteroids, Digoxin, Diuretics & NSAIDs regarding lack of annual monitoring of U&Es, lack of advice regarding risk of hypokalaemia for digoxin, consideration of thyroid status on digoxin, BP and pulse on digoxin, and lack of follow-up checks of HbA1c for development of diabetes re long term use of corticosteroids. Entries for these drug groups updated to reflect these requirements. Link to digoxin SPC added.
7.0	September – October 2017	Updated by Fiona Marshall, TAG Lead Pharmacist, NEL CSU Anglia, on behalf of TAG	Final	Entries for azathioprine, ciclosporin, leflunomide, methotrexate, mycophenolate mofetil and sulfasalazine updated in line with the revised local shared care agreements which had been amended in line with the British Society for Rheumatology (BSR) and the British Health Professionals in Rheumatology (BHPR) guidance for the prescription and monitoring of non-biologic disease-modifying anti-rheumatic drugs (February 2017) https://doi.org/10.1093/rheumatology/kew479 Entry for gold also updated in line with revised BSR / BHPR guidance. All BNF links updated. Supported by the TAG November 2017.
8.0	January 2019	Updated by Fiona Marshall, TAG Lead Pharmacist, AGEM CSU, on behalf of Prescribing Reference Group for the TAG	Draft	All hyperlinks to Knowledge Anglia, and external websites reviewed and updated. Checked against UKMi Suggestions for Drug Monitoring in Adults in Primary Care (October 2017). **Entries reviewed:** ACEIs/ ARBs, NSAIDs and diuretics: Think Kidneys re AKI links added Hydroxycarbamide: uric acid / Hydroxychloroquine: Baseline Height, Weight BP Mesalazine: LTFs added Nitrofurantoin (long term use): new entry Phenytoin: Baseline tests – U&Es, Vitamin D added Spironolactone: U&Es "include creatinine" Statins: Baseline – BP, BMI Warfarin: Baseline - FBC – incl platelet count, LFT, Renal function, Thyroid status, BP (for HAS-BLED score)