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Drug Monitoring Recommendations

NHS Sunderland Clinical Commissioning Group

This guide is intended as a quick reference for primary care clinicians, and is not exhaustive. It is based on common recommendations. The frequency of testing may need to be tailored to individual patients, their condition and concurrent treatment. For more details see latest BNF, NICE, CKS, local guidance & shared care documents and the individual SPCs available at: www.medicines.org.uk.

Drug	Baseline	Routine	Comments
Gastrointestinal system			
Mesalazine and Balsalazide	U&Es	U&Es	3 monthly for first year, then 6 monthly for 4 years, then 12 monthly. FBC and WCC only if blood dyscrasia suspected.
Cardiovascular System			
ACEI / A2RA &	U&Es, BP	U&Es, BP	1-2 weeks after initiation or significant dose change, then 12 monthly. More frequently for patients taking diuretics and those with renal impairment or unstable heart failure. BP 2-4 weeks after initiation or dose change
Sacubitril/Valsartan	See entresto information leaflet		
Amiodarone	TSH, fT3, fT4, LFTs Chest X-ray, U&Es, ECG, Thyroid a/b	TSH, fT3, fT4	3 months after starting then 6 monthly, including the year after stopping.
		LFTs	6 monthly Chest X-ray if pulmonary toxicity suspected.
Dronedarone	LFTs	LFTs	Check LFTs 1 week after and 1 month after initiation of treatment, then monthly for 6 months, then every 3 months for 6 months and periodically thereafter—discontinue treatment if 2 consecutive alanine aminotransferase concentrations exceed 3 times upper limit of normal. Patients or their carers should be told how to recognize signs of liver disorders and new onset or worsening heart failure
Digoxin	U&Es	U&Es	12 monthly. Routine drug levels not necessary, but consider if toxicity suspected, significant weight loss, hypokalaemia or hypothyroidism – At least 6 hrs post dose. Ideally 8–12 hours.
Ivabradine	HR	HR	Do not initiate if resting heart rate is less than 70 bpm Stop treatment if resting HR is persistently less than 50 bpm If AF occurs consider benefits and risks of continued treatment
Thiazide and related Diuretics	U&Es	U&Es, $HbA1_c$	U&Es 4-6 weeks after initiation, and 1-2 weeks after dose alteration, then 6-12 monthly - stop if eGFR<30mL/min non-diabetic patients: 12 monthly $HbA1_c$ or for diabetic patients, as dictated by diabetes reviews
Spironolactone	U&Es	U&Es	U&Es monthly for the first 3 months, then every 3 months for a year, then every 6 months thereafter
Loop Diuretics	U&Es	U&Es	1-2 weeks after initiation and each dose increase Earlier monitoring (after 5–7 days) may be required for people with existing renal impairment or those taking a combination of a diuretic plus an ACEi/ARB, or an aldosterone antagonist. For people receiving a combination of a loop diuretic and a thiazide: check renal function within 5 days of starting combination treatment and recheck every 5–14 days until stable. Monitor weight and hydration status Once treatment is stable monitor 6 monthly

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Fibrates	LFTs, CK, Lipids, U&Es	LFTs	Every 3 months for first year then periodically.
		U&Es	Fenofibrate – during first 3 months then periodically. Otherwise annually
		Lipids	If response inadequate after 3 months stop. 12 monthly thereafter.
		CK	Check only if myopathy or rhabdomyolysis suspected
		FBC	Gemfibrozil requires FBC 3 monthly for first year
Statins	See 'SLiMS' guidance		
Warfarin	See 'AF guideline'		
Novel Oral Anticoagulants (NOACs)			

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Respiratory System			
Theophylline		Drug level	6 –12 monthly once maintenance dose reached or if signs of toxicity. Range 10-20mg/l. Measure pre-dose trough (immediately before next dose).
Central Nervous System			
Amisulpride, Aripiprazole, Asenapine, Quetiapine, Risperidone Olanzapine	See Antipsychotic information leaflet		
Citalopram and Escitalopram	ECG, U&Es, Magnesium (Mg) – see comments	Mg – see comments	Baseline tests and annual monitoring of serum magnesium is only advised for at risk groups: I.e those patients who are aged over 65 years OR are malnourished (BMI less than 18kg/m^2) AND are taking a diuretic or a proton pump inhibitor. If cardiovascular symptoms, such as palpitations, vertigo, syncope, or seizures develop during treatment, cardiac evaluation including an ECG should be undertaken
Venlafaxine	BP	BP	6 monthly

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Drug treatment in epilepsy	**Nice CG 137** • **Regular blood drug level monitoring is not recommended as routine and should be done only if clinically indicated** (e.g. for detection of non-adherence to the prescribed medication, suspected toxicity, adjustment of phenytoin dose, management of pharmacokinetic interactions e.g. changes in bioavailability, changes in elimination, and co-medication with interacting drugs, specific clinical conditions, for example, status epilepticus, organ failure and certain situations in pregnancy) • Otherwise, FBC, LFTs, U&Es, vitamin D levels and other tests of bone metabolism every 2 years for adults taking enzyme-inducing drugs. • Asymptomatic minor abnormalities in test results are not necessarily an indication for changes in medication.		
Carbamazepine	FBC, LFTs, U&Es, Wt & Ht	See above	Drug levels: Sample time – trough, before first dose of the day Therapeutic range: epilepsy 4-12 mg/Levels >12mg/L associated with increased side effects
Phenytoin	FBC and LFTs	See above	Folate levels (and TFTs in children) every 2 years Drug levels: Sample time – trough, before first dose of the day Time to steady state – variable Therapeutic range – 10-20 mg/L
Sodium Valproate	LFTs, U&Es, FBC, Clotting, Wt & Ht	LFTs after 3 months	FBC and clotting before surgery and in cases of spontaneous bruising or bleeding. Regular Wt for patients who gain weight rapidly Drug levels: Sample time – trough, before first dose of the day Time to steady state – 2-3 days. Therapeutic range – 50-100 mg/L
Lamotrigine	FBC, LFTs, U&Es	No regular monitoring required (NICE CG 185)	
Lithium	See Lithium shared care document		
Methylphenidate, Atomoxetine & Dexamfetamine.	See shared care documents		

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Infections			
Nitrofurantoin	U&Es	Nitrofurantoin is contraindicated in patients with an eGFR of less than 45 ml/min/1.73m^2. Short courses of nitrofurantoin may be used with caution in patients with eGFR 30-44ml/min. For prophylactic therapy; Treatment should not normally exceed 6 months and patients should remain under the care of urology during this period. Consideration should be given to pulmonary fibrosis if respiratory symptoms develop, especially in the elderly, and treatment should be discontinued if any evidence of deterioration in lung function	
Minocycline (not a preferred treatment option)	LFTs	FBC and LFTs	3 monthly Check for signs/symptoms of hepatotoxicity or Systemic Lupus Erythematosus (SLE) pigmentation
Terbinafine	LFTs	LFTs	4-6 weeks after initiation
Endocrine System			
Levothyroxine	TSH, T4, ECG	TSH	Measure at least 6 – 8 weeks following a dose change then 12 monthly once stable
Carbimazole & Propylthiouracil	TFTs, FBC, LFTs	TFTs	Every 1-3 months until stable, then 12 monthly
		FBC	Test immediately if warning signs of infection (sore throat, mouth ulcers, bruising, bleeding, fever) Regular FBC should be carried out in confused patients or those with poor memory.
		LFTs (Propylthiouracil)	At 3 and 6 months then annually
Pioglitazone	LFTs, Wt	LFTs	12 monthly. Advise patients to seek immediate medical attention if symptoms such as nausea, vomiting, abdominal pain, fatigue and dark urine develop; discontinue if jaundice occurs. Monitor weight regularly. Monitor for signs and symptoms of heart failure.
Gliptins	U&Es, LFTs and HbA1C	LFTs (Vildagliptin)	3 monthly for first year, then 12 monthly
		HbA1c	2 to 6 monthly until person stable on treatment then 6 monthly (or according to individual need). Discontinue if HbA1c has not reduced by at least 5.5 mmol/mol within 6 months of starting treatment.
		U&Es	6 monthly, dose adjustments may be required in renal function declines
Exenatide and Liraglutide	Weight and HbA1c	Weight and HbA1c	3 monthly. Discontinue if HbA1c has not reduced by at least 11 mmol/mol and if a weight loss of at least 3% has not been achieved at 6 months.
Musculoskeletal System			
DMARDs	see shared care issued with request to initiate shared care		
NSAIDs	Renal function should be monitored in patients with renal, cardiac or hepatic impairment		

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Abbreviations:			
ACEi	Angiotensin converting enzyme inhibitors	fT4	Free T4
A2RA	Angiotensin-II receptor antagonists	fT3	Free T3
U&Es	Urea and electrolytes, creatinine and eGFR	Thyroid a/b	Thyroid antibodies
LFTs	Liver function tests	CV	Cardiovascular
CK	Creatine phosphokinase	BP	Blood Pressure
Li	Serum lithium	Wt	Weight
FBC	Full blood count	Ht	Height
Plts	Platelets	ECG	Electrocardiograph
FBG	Fasting blood glucose	HbA1c	Glycosylated Haemoglobin (mmol/mol)
TFTs	Thyroid function tests	BP	Blood pressure
TSH	Thyroid stimulating hormone	NECS	North of England Commissioning Support
ULN	Upper limit of normal	SBP	Systolic blood pressure
AST/ALT	Aspartate transaminase/alanine transaminase		