THE PRIMARY CARE COMPANION
FOR CNS DISORDERS

Supplementary Material

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List of Supplementary Material for the article

1. Supplementary Table 1

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Supplementary Table 1. Raw Information From All Sources Reviewed

Class/Medication	At Initiation	Titration Period	Maintenance Period	Source	Notes
Mood Stabilizers					
Lithium	Serum Cr, estimated Cr clearance, electrolytes, thyroid profile, pregnancy test	Li level q4-14 days	Li level q6 mo. Annual sCr, eCrCl, TSH (x5 yrs), CBC w/diff	VA/DoD bipolar disorder CPG 2010 (p. 77, Table E-5)	If sCr elevated, but still <2, after repeat check, obtain 24 hr CrCl q3-9 mo. If sCr>2, obtain 24 hr CrCl, and notify PCP/nephrology. TSH yearly x5 yrs, if continues to be normal, then check only when clinically warranted
	medical hx, physical exam, BUN/Cr, pregnancy test, thyroid function evaluation, consider CBC, EKG (if over 40)	Li levels 5 days after dose increase and before next dose increase.	First six months, renal (BUC/Cr) and thyroid function (TSH) check once or twice. After 6 months, renal and thyroid fx every 6mo to 1 year or if clinically indicated.	APA bipolar disorder PG 2002 (p. 34)	
	wt or BMI, BUN, electrolytes including calcium, eGFR, thyroid function, CBC. EKG if risk factors.	Li level 1 week after start, and 1 week after every dose change, then weekly until levels stable.	First year: Li level q3 mo. After, q6mo, or q3 mo if older, there are medical interactions of concern, risk for renal/thyroid/ca complications, poor adherence, poor sx control, or level has been >0.8. Q6mo: wt or BMI, BUN, electrolytes including Ca, eGFR, TSH.	NICE bipolar disorder, CG185 2014. Summary version (p. 34)	
	Kidney function tests (Cr, urine sp grav), thyroid function tests, EKG (age>50), wt, consider fglu/FLP	Level every 1-2 weeks until desired serum concentration resached, then every 2-3 for first 6 months.	Kidney function tests 1-2x/yr. Monitor wt and BMI. Frequent test to monitor trough lithium levels, 12 hours after last dose; stable monitoring every 6-12 months and after dose changes or other medication changes or illness. Consider measuring diabetes status (fGlu) and dyslpidemia due to risk of weight gain.	Stahl's 6th ed. 2017.	
	waist circ and/or BMI, BP, CBC, electrolytes/BUN/Cr, LFTs including Tbili, fGlu, FLP, upreg. EKG >40 or if indicated. Prolactin. Utox. PT/PTT, TSH.	2 Li levels to establish therapeutic dose after dose increases	urea/cr q3-6 mo. Ca/TSH/wt q6 mo twice, then annually. Li level q3-6 mo.	ISBD consensus monitoring guidelines 2009 (p. 562, Fig. 1)	CANMAT references this in recent 2013 update
	waist circ and/or BMI, BP, CBC,electrolytes/urea/cr, LFTs including Tbili, fGlu, FLP, upreg. EKG >40 or if indicated. Prolactin. Utox. PT/PTT, TSH.	Li level 5 days after dose titration, get 2 consecutive within therapeutic range	Li levels q3-6 mo. CBC and LFT at 1 month, then q3-6 mo. TSH and Cr/Bun annually.	CANMAT bipolar d/o guidelines 2005 (p. 47-50).	CANMAT issued guidelines in 2005 with several updates since that time, with same baseline labs recommended for all patients with bipolar disorder, not specific to treatment choice. In the detailed CANMAT update in 2014, providers were also directed to ISBD guidelines (also noted in this table) for other specific monitoring recommendations. Also note, if h/o renal disease, CANMAT recommends obtaining 24 hr creatinine clearance at baseline specific to lithium.
Carbamazepine	CBC w/diff, LFTs	CBZ level q2 wks x3 mo, CBC w/diff, LFTs at 1 and 3 mo.	annual CBZ level, CBC w/diff, LFTs, electrolytes	VA/DoD bipolar disorder. 2010 (p. 77, Table E-5).	
	Medical hx and physical exam (focusing on blood and liver concerns). CBC with diff and platelets, LFT (to include LDH, SGOT, SGPT, bilirubin, alkaline phosphatase), BUN, Cr. Consider electrolytes especially in eldarly.	First 2 mo: CBC, platelet, LFTs q2 weeks.	If normal and no evidence of bone marrow suppression or hepatitis, then CBC and LFTs q3 mo.	APA Bipolar disorder. 2002 (p. 38)	CBZ levels only if toxicity or noncompliance suspected
	waist circ and/or BMI, BP, CBC, electrolytes/urea/Cr, LFTs including Tbili, fGlu, FLP, Upreg. EKG if >40 or if indicated. Prolactin. Utox. PT/PTT, TSH.	CBC and LFT at 1 mo.	q3-6mo: CBC, LFT	CANMAT bipolar d/o guidelines 2005 (p. 47-50).	See above note on CANMAT
				NICE bipolar disorder guidelines CG 185 2014 do not give monitoring information for CBZ	
	CBC; liver, kidney and thyroid function tests. If Asian, consider screening for HLA-B*1502 allele	First 2 mo: CBC every 2-4 weeks.	CBC q3-6mo,liver, kidney, thyroid function tests q6-12mo. Consider Na due to risk of hyponatremia.	Stahl's 6th ed. 2017.	
	waist circ and/or BMI, BP, CBC, electrolytes/urea/cr, LFTs, fGlu, FLP, upreg	2 levels to est therapeutic dose, 1 mo apart. CBC, LFT, electrolytes/urea/cr monthly x3 mo.	CBC, LFT,electro lytes/urea/cr annually. Bone densitometry if risk factors. Review contraceptive efficacy.	ISBD consensus monitoring guidelines 2009	
Lamotrigine	CBC, BUN, electrolytes, LFT			NICE bipolar disorder guiidelines CG185 2014	
	waist circ and/or BMI, BP, CBC, electrolytes/urea/Cr, LFTs, fGlu, FLP, Upreg			ISBD consensus monitoring guidelines 2009	
Oxcarbazepine			consider monitoring Na due to risk of hyponatremia, especially during first 3 months.	Stah'ls 6th ed. 2017.	
Topiramate	Bicarb		periodic bicarb	Stahl's 6th ed. 2017.	
	renal function, Upreg		periodic creatinine/CrCl	VA/DoD Bipolar disorder CPG 2010	
	assess renal function, Upreg		monitor Cr and creatinine clearance periodically, particularly in patients with renal insufficiency and the elderly	VA/DoD SUD CPG 2015	
VPA	CBC w/diff, LFTs	VPA level no sooner than 5-7 days after change in dose. CBC w/diff, LFTs at 1 and 3 mo.	Annual: VPA level, CBC w/diff, LFTs, electrolytes	VA/DoD Bipolar disorder CPG 2010 (Table E-5, p 77)	
	waist circ and/or BMI, BP, CBC,electrolytes/urea/cr, LFTs including Tbili, fGlu, FLP, upreg. EKG >40 or if indicated. Prolactin. Utox. PT/PTT, TSH.	VPA level to ensure therapeutic on 2 occasions. CBC and LFT at 1 mo.	q3-6mo: VPA level, CBC, LFT	CANMAT bipolar d/o guidelines 2005 (p. 47-50).	See CANMAT note above.
	medical hx (focus on liver/blood abnormalities). LFT, CBC	VPA level after dose initiation at 20-30mg/kg to guide dose adjustments	Debate: some only monitor clincally and provide education on liver and hematologic dysfunc. Most psychiatrists: CBC, LFTs q6 mo. Sooner if unreliable pt.	APA Bipolar disorder. 2002. (p. 36)	
	wt or BMI, CBC, LFT	at 6 mo: wt/BMI, LFT, CBC	Annually: wt/BMI, LFT, CBC	NICE bipolar disorder CG185 2014. Full version, p. 324.	levels only if question of noncompliance/toxicity
	CBC, coagulation tests, LFT	First few months: regular LFT, platelet	LFT, platelet ct 1-2x/yr. Monitor wt/BMI. Consider diabetes (glucose monitoring) and dyslipidemia assessment. Plasma drug levels, no specific intervals.	Stahl's 6th ed. 2017.	
	waist circ and/or BMI, BP, CBC, lytes/urea/cr, LFTs, fGlu, FLP, Upreg	2 levels to establish therapeutic dose.	wt, CBC, LFT, menstrual hx q 3mo in first year, then annually. BP/fGlu/FLP if risk factors, bone densitometry if risk factors.	ISBD consensus monitoring guidelines 2009. Baseline recommendations for all patients as in Figure 1, p. 563; specific to VPA in Table 5, p. 574.	

Antipsychotics	Fasting (or random) glucose, lipid profile (fasting if possible, random if not), BMI/weight, BP.		Hemoglobin A1c for long-term monitoring, fasting or random glucose, and lipid profile (fasting, or random if this cannot be done) at 12 weeks, 6 months, then annually. BMI/weight frequently early in treatment, e.g. weekly for first 4-6 weeks, at a minimum once every 4 weeks for 12 weeks,then at 6 months and after that annually unless clinically indicated to be more frequent. BP at 12 weeks, 6 months, then annually.	British Association for Psychopharmacology (2016).	
Atypical Antipsychotics	personal family history, weight and BMI, waist circ, BP, fasting glucose, FLP, upreg	weight and BMI: at 2, 8, 12 weeks. At 12 wks: BP, fGlu, FLP	First year Q3 months: weight and BMI. Q12 months: waist circ, BP, fGlu. Q5 yr: FLP if perviously normal and no weight gain.	VA/DoD Bipolar d/o CPG 2010 (p 102) based on ADA/APA recommendations	fGlu recommended rather than A1c.
	personal FH, weight and BMI, waist circ recommended, fGlu, FLP	weight/BMI: every visit x6 mo. fGlu: at 4 mo.	wt and BMI: quarterly if stable. Fglu: if no s/s diabetes and no sig wt gain, annually. If wt gaiin >=1 unit BMI increase, q4 mo. FLP: q2 yr ifi normal, q6 mo if LDL >130.	VA/DoD Bipolar d/o CPG 2010 (p 102) based on Mt Sinai Conf. recommendations	waist circ: intervention for women >=35", men >=40". Mt. Sinai conference paper: https://academic.oup.com/schizophreniabulletin/article/28/1/5/1907056
	BMI, waist circ, BP, fGlu, FLP	wt: 4, 8, and 12 wks initially. BP, FLP, and fGlu at 12 wks.	Wt quarterly. Annual: personal history, BP and fGlu. Q5 yr: FLP.	ADA/APA/AACE 2004	Consensus development conference on antipsychotic drugs and obesity and diabetes. Diabetes Care 2004; 27: 596-601
	wt (charted), HR, BP, fGlu, A1c, FLP. EKG if h/o CV risk (sudden death, arrhythmia), inpatient, or product literature specifies.	First 6 weeks: wt or BMI weekly.	Weight charted at 12 weeks, one year and annually. Annually waist circumference. At 12 weeks, FG, A1c, HR/BP, FLP.	NICE psychosis and schizophrenia in adults. CG178, p. 587. 2014.	
	wt, BMI, waist circ, BP, fGlu, FLP	BMI monthly x3. At 3mo: BP, fglu, ; consider getting monthly for several months if at high risk for metabolic complications.	BMI quarterly. Annually: BP, fGlu, FLP. More frequently if risk factors.	Stahl's 6th ed. 2017.	CBC(if having low WBC or history of drug-induced neutropenia or leukopenia); LFT (if having liver disease, measure a few times/year).
	weight, BP,FG, FLP.	wt monthly x3 mo. BP and fGlu q3 mo x1 year. FLP at 3 mo.	q3 mo: wt. annually: BP and fGlu, FLP. ECG and prolactin as indicated.	ISBD consensus monitoring guidelines 2009 (p. 579, Table 7).	
	fGlu, A1c		A1c and fGlu after 4 mo; if normal, annually	British expert group, BJP 2004	
	BMI, waist circ, BP, fGlu, FLP		Q3mo: weight, waist/hip ratio. Q6 mo: fGlu, BP, LP (for 1 year, then annually).	Australian consensus group (Lambert, et al.) 2005	A1c only if diabetes diagnosed based on fasting glucose results. Not specified if lipids are fasting. Based on ISBD recommendations and also combined with Belgian Consensus Group 2005. Lambert and Chapman. Diabetes, psychotic disorder and antipsychotic tx: a consensus statement. Med J Aust 2004; 181: 544-548.
Typical Antipsychotics	No specific monitoring discussed.			VA/DoD Bipolar disorder. 2010	
	No specific monitoring discussed.			APA schizophrenia. 2004	Detailed prescribing and safety information is presented, but without specific monitoring recommendations.
	(AP in general) wt, waist circ, HR, BP, fGlu, a1c, FLP, prolactin. EKG if RF	wt weekly x6 wks, then at 12 wks, then 1 year. HR, BP, fGlu, a1c, FLP at 12 weeks, then 1 year.	Annually: wt, waist circ, HR, BP, fGlu, a1c, FLP	NICE psychosis and schizophrenia in adults. CG178, p. 587. 2014.	Carduac risk factors to consider for EKG include HTN (any personal hx of CV disease)
	Weight/BMI. Consider checking diabetes status, lipids due to risk of weight gain. BP in elderly.	Consider monitoring fasting triglycerides monthly for several months in patients at risk for metabolic complications, as well as glucose status in those at risk. Follow BP in first few weeks in elderly.	Monitor weight/BMI.	Stahl's 6th ed. 2017.	Monitoring elevated prolactin levels of dubious clinical benefit. In patients with low WQBC or history of drug-induced neutropenia/leukopenia, mointor CBC frequently during first few months.
Antidepressants	consider pregnancy test; consider ECG if cardiovascular risk factors present, electrolytes in older patients, and bone desnity scan especially if risk factors for osteoporosis		hyponatremia risk should be monitored in at risk groups (e.g., older patients) especialy with SSRI/SNRI/mirtazapine	Dodd et al. 2017.	Expert consensus group published in World Journal of Biological Pyschiatry, 2017.
SSRI	No specific monitoring guidelines.			VA/DoD major depressive disorder. 2016	
	No specific monitoring guidelines.			APA major depression. 2010	
	No specific monitoring guidelines.			RANZCP 2015	
	No specific monitoring guidelines.			CANMAT Major depression 2016	
	No specific monitoring guidelines.			NICE Depression in adults. CG90. 2009, last updated 2016	
TCAs	No guidelines for initiation mnitoring.		monitor plasma drug concentrations for therapeutic dose and to limit tox risk: desipramine, imipramine, nortriptyline	VA/DoD Major depression CPG 2016. (p. 98, Table C-2)	therapeutic plasma drug concentrations: desipramine (125-300 ng/mL), imipramine (200-350 ng/mL), nortriptyline (50-175 ng/mL)
	EKG for patients "with significant cardiac risk factors and patients older than age 50 years."		consider f/u EKG. Consider plasma levels, especially nortriptyline, amitriptyline, desipramine, imipramine.	APA Major depression guideline 2010. (p. 41)	
Venlafaxine			BP at higher doses	NICE depression in adults, CG90 2016	
Stimulants	weight/height, EKG if indicated			NICE attention deficit disorder, CG 72. 2008.	with the National Collaborating Centre for Mental Health (NICE)
			HR and BP (when used as augmentation)	VA/DoD Depression CPG 2016	

Substance Use Disorders					
Disulfiram	Liver transaminases, EKG if h/o cardiac dz, upreg, verify abstinence with breathlyzer or blood alcohol level	LFTs within 1st month, then monthly for 3 months	LFTs periodically after 3 months as indicated	VA/DOD Substance use disorder. 2015.	VA/DoD CPG Management of SUD 2015
Naltrexone	Liver transaminases, total bilirubin, upreg for females. For long acting injectable (Vivitrol), specifically notes to assess for CrCl > 50, estimated or measured.	Liver transaminases at 6 months	Liver transaminases annually	VA/DOD Substance Use Disorder CPG 2015	
Acamprosate	CrCl, upreg for females		monitor creatinine/CrCl particularly in elderly and renal dz	VA/DOD Substance Use Disorder CPG 2015	
Opiate Substitution	No specific monitoring guidelines.			ASAM guidelines. 2015.	ASAM (American Society of Addiction Medicine). The National Practice Guideline for the Use of Medications in the Treatment of Addiction Involving Opioid Use. 2015
Methadone	consider baseline EKG for patients at risk of QT prolongation or arrhythmias			VA/DOD Substance Use Disorder CPG 2015	
Buprenorphine	Liver transaminases		Liver function tests prior to initiation and during therapy.	VA/DOD Substance Use Disorder CPG 2015	
SUD	No specific monitoring guidelines.			NICE alcohol use disorder. 2011.	National Collaborating Centre for Mental Health (NICE) 2011 Alcohol Use Disorders
Other					
T3 augmentation	TSH, free T3 and free T4 prior to initiation.		Repeat same thyroid panel at 3 months, then every 6 months or at a minimum, annually.	Source from published literature.	Rosenthal et al, (2011) AJP 168:1035. See page 1038. Goal TSH at lower limit of normal or below if there are no clinical hypothyroid symptoms. Measure bone dsenity every two years in post-menopausal women while treating with T3 augmentation.