Adolescent Version

Positive Cardiometabolic Health: An early intervention framework for adolescents on psychotropic medication

Adapted from Curtis J, Newall H, Samaras K. ©HETI 2011

Lifestyle			Overweight / Obesity		Blood Pressure	Glucose	Blood Lipids	Polycystic ovary syndrome
Smoking	Diet	Activity	Weight, BMI	Waist				
Lifestyle advice to include diet, physical activity and smoking prevention or cessation								
RED ZONE								
Current Smoker	Poor diet	Sedentary lifestyle	BMI ≥ 85th centile* AND/OR Weight ↑ > 5kg over 3 months	Waist:height ratio ≥ 0.5 AND/OR Waist ↑ > 5cm over 3 months	≥ 90th centile^ systolic AND/OR diastolic (use appropriate cuff size for arm circumference)	FPG ≥ 5.6 mmol/L OR RPG ≥ 11.1 mmol/L AND/OR HbA_{1c} ≥ 42 mmol/mol (≥6%)	Total Chol ≥ 5.2 mmol/L LDL ≥ 3.4 mmol/L HDL < 1.03 mmol/L Trig ≥ 1.7 mmol/L	Delayed menarche, No periods for 3 months, Acne, Hirsutism
Intensify and individualise structured nutritional counseling and lifestyle interventions (consider dietitian and/or exercise professional referral)								
Medication review (consider antipsychotic switching; review medications and rationalize any polypharmacy)								
INTERVENTION								
Individualised Smoking cessation program quitnow.gov.au icanquit.com.au	↓ Energy intake Stop soft drinks / juices ↑ Vegetables & fibre eatforhealth.gov.au	↓ Sedentariness ↓ Screen time ↑ Physical activity exerciseismedicine.org.au	Consider metformin BMI ≥ 95th centile* refer to specialist	≥ 95th centile^ Refer to GP or specialist	At high risk of Diabetes FPG : 5.6-6.9 mmol/L HbA_{1c} 42-47 mmol/mol (6.0-6.4%) OGTT; if abnormal, refer to specialist Consider metformin	Diabetes FPG ≥ 7.0 mmol/L RPG ≥ 11.1 mmol/L HbA_{1c} ≥ 48 mmol/mol (≥6.5%) Endocrine referral	Refer to GP or specialist	Check prolactin Consider metformin (ensure contraception if sexually active)
TARGET								
Smoking prevention or cessation	Improve quality of diet	Physical activity (eg > 60 mins per day) Screen-based activities < 2hrs/day	BMI ≤ 85th centile* Waist:height ratio < 0.5	< 90th centile^	Prevent Diabetes FPG ≤ 5.5 mmol/L HbA_{1c} <42 mmol/mol (<6.0%)	HbA_{1c} 42-53 mmol/mol (6.0-7.0%)	Total Chol < 4.4 mmol/L LDL < 2.85 mmol/L HDL > 1.56 mmol/L Trig < 1.02 mmol/L	Regular menstrual cycle

*BMI sex-specific centile chart, either US-CDC or WHO. Ensure that the same chart is used over time to allow for consistent monitoring of growth ^Pediatrics 2004; 114;555

BMI = Body Mass Index | FPG = Fasting Plasma Glucose | RPG = Random Plasma Glucose | Total Chol = Total Cholesterol | LDL = Low Density Lipoprotein | HDL = High Density Lipoprotein | Trig = Trigylcerides

History & examination following initiation or change of psychotropic medication:

History: Seek history of smoking, poor diet (eg high calorie, high fat/ sugar), physical activity and sedentariness (eg screen time), polycystic ovary syndrome. Ask about family history (diabetes, obesity, early CVD), gestational diabetes. Note ethnicity.

Frequency: As below. Consider more frequently if changing medications, rapid weight gain, abnormal lipids, glucose or blood pressure.

	Baseline	Weekly**	3 months	6 months	9 months	12 months
Personal / FHx	✓					✓
Lifestyle Review*	✓	✓	✓	✓	✓	✓
Weight	✓	✓	✓	✓	✓	✓
Height (BMI)	✓			✓		✓
Waist Circumference	✓		✓	✓	✓	✓
Blood Pressure	✓		✓	✓		✓
FPG/RPG/HbA1c	✓		✓	✓		✓
Lipid Profile^	✓		✓	✓		✓
LFTs	✓			✓		✓
Vitamin D	✓			✓		✓

**Smoking, diet & physical activity*
^Total cholesterol LDL, HDL, triglycerides. If fasting samples are impractical, then non-fasting samples are satisfactory for most measurement, except for triglycerides

**
Weight should be assessed 1- 2 weekly in the first 6 - 8 weeks following initiation or change of medication. Adolescents may be at particular risk of rapid early weight gain and this may predict severe weight gain in the longer term

Other baseline investigations are not included here and need to be performed as clinically required (eg TFTs, UECs, FBC, ECHO). Additional monitoring requirements apply for those on mood stabilizers & clozapine (eg medication plasma levels). Prolactin measurement only recommended if symptomatic. Consider ECG/ cardiology review if concern re QT prolongation or cardiovascular risk factors present.

Ensure adequate contraception and sexual health advice. Some medications used to treat metabolic disorder are contraindicated in pregnancy (eg some antihypertensives and lipid lowering drugs). Other issues such as sleep and substance use have not been included in this resource though are important to discuss with all adolescents.

The general practitioner and psychiatrist/mental health clinician will work together to ensure appropriate monitoring and interventions are provided and communicated

After 12 months, continue to monitor regularly, with increased frequency if abnormality of physical health emerges, which should then prompt appropriate action and/or continuing review at least every 3 months

Don't just screen... INTERVENE for all adolescents in the RED ZONE

Interventions:

Promote benefits of healthy lifestyle to parents and carers

Strategies include: metabolic apps, lifestyle workbook, weblinks.

Review of psychotropic medications: Normally psychiatrist supervised and should involve discussion with adolescent and parents/carer. Choose lower metabolic liability medication first-line where possible. Review diagnosis and ensure ongoing need for all psychotropic medications. Consider switching to a more weight neutral medication where possible. Avoid antipsychotic polypharmacy. Avoid off-label use of antipsychotic medications.

If adolescent has not successfully reached their targets after 3 months, then consider specific pharmacological interventions.

Specific Pharmacological Interventions:

Consider metformin trial if:
- impaired fasting glucose
- polycystic ovary syndrome
- obesity or rapid weight gain

Note that **off-label** use requires documented informed consent

Metformin therapy: start at 250mg before dinner for two weeks, then increase to 250mg bd. Dose can be increased by 500 mg per week to a maximum of 2 grams daily. If side-effects of nausea, abdominal cramping, shift to after meal (or the XR preparation)

Lipid lowering therapy: (use PBS guidelines): consider lipid lowering therapy if severe hyper-lipidemia or with other risk factors with appropriate specialist referral

Anti-hypertensive therapy: refer to specialist paediatrician

Vitamin D:
- <50 nmol/L: replenish stores: cholecalciferol 4,000 IU per day for one month;
- maintenance: 1,000 IU daily. Target 80-140 nmol/L.

Download Adolescent version of Positive Cardiometabolic Health algorithm: www.heti.nsw.gov.au/cmalgorithm