

Table 4: Components of the 4ms Framework for Assessment of Obesity⁷⁷

Category	Complications	Frequency	Investigations	Treatment Notes
Mental Health	Knowledge/cognition	++ *		
	Expectations	++ *		
	Self-image	++ * (F>M)		
	Internalized weight bias	+++	This can be accomplished through sensitive questioning/dialogue (e.g., "Can you share with me if or how your weight affects your perception of yourself/motivational interviewing,") or by questionnaire (WBIS). See the chapter Reducing Weight Bias in Obesity Management, Practice and Policy for details.	Unresolved perception of weight bias can have an influence on obesity management. Coping strategies to address internalized weight bias should be incorporated into behavioural interventions, consistent with the principles of cognitive behavioural therapy and acceptance and commitment therapy.
	Mood/Anxiety	++ * (F>M)	PHQ-9, GAD	If starting pharmacotherapy, consider options that do not increase weight (see the chapter Prevention and Harm Reduction of Obesity (Clinical Prevention))
	Addiction	++ *	Yale Food Addiction Scale	
	Sleep	++ *		
	Attention	++ *		
Personality	++ *			
Mechanical	Osteoarthritis	++	History, X-ray	
	Gout	+++	Uric acid level	Avoid steroids if possible
	Sleep apnea	+++	STOP BANG sleep apnea questionnaire , Berlin Questionnaire , overnight sleep study	CPAP therapy if indicated
	Plantar fasciitis	++ *		
	Gastroesophageal reflux	++		
	Urinary incontinence	++ *		
	Intertrigo	++ *		
	Idiopathic intracranial hypertension (Pseudotumour Cerebri)	+		
Thrombosis	+			
Metabolic	Type 2 diabetes	+++	A1c, fasting glucose	Consider medication options that are weight neutral, promote weight loss
	Hyperlipidemia	+++	Total cholesterol, triglycerides, HDL-C	
	Nutritional deficiency	+++	25 hydroxy-vitamin D, iron studies, serum B12 level	Vitamin D 1000-3000 units/day, supplement as needed to achieve therapeutic levels
	Gout	+++	Uric acid	Avoid prednisone if possible
	Hypertension	++	Ensure appropriate cuff size (bladder width 40% of arm circumference, length 80–100% of arm circumference) ⁵⁴	DASH diet , consider secondary causes (eg. sleep apnea, pain) Prioritize medications that affect the renin-angiotensin system, avoid beta blockers as first line

	<p>Endocrine</p> <p>PCOS/hypogonadism</p> <p>Infertility</p>	<p>+</p> <p>+</p>	<p>Total testosterone, estradiol, prolactin, 17 hydroxyprogesterone, LH/FSH, DHEAS, TSH if clinical suspicion of hypothyroidism</p>	<p>Consider metformin if insulin resistant</p>
	<p>Cardiovascular disease</p> <p>Left ventricular hypertrophy, atrial fibrillation</p> <p>Chronic venous stasis/ulcers/thrombophlebitis</p> <p>Stroke, DVT/PE</p> <p>Neurological</p> <p>Pseudotumor cerebri</p>	<p>++</p> <p>+</p>	<p>ECG, ECHO, treadmill/bicycle/nuclear stress test if indicated and if patient able</p> <p>Hx: Headache, pulsatile tinnitus, papilledema</p>	
	<p>Gastrointestinal disease</p> <p>Fatty Liver</p> <p>Gallstones</p>	<p>++/+++</p> <p>+++</p>	<p>Liver enzyme elevation, increased liver stiffness (elastography) abdominal ultrasound, FIB-4 score</p>	
	<p>Oncology</p> <p>Colorectal, gallbladder, pancreatic, breast, renal, uterine, cervical, prostate</p>	<p>+</p>	<p>Routine cancer screening</p>	<p>Patients with obesity are at high risk for certain cancers and are less likely to be screened due to technical issues with diagnostic testing and delays in seeking medical attention.</p>
	<p>Skin</p> <p>Acanthosis, skin tags</p> <p>Candida</p> <p>Intertrigo</p> <p>Tinea</p> <p>Folliculitis</p>	<p>+++</p> <p>++*</p> <p>+*</p> <p>+*</p> <p>+*</p>		
<p>Monetary Health / "Milieu"</p>	<p>Socioeconomic status</p> <p>Education</p> <p>Access to food</p> <p>Occupation</p> <p>Disability</p> <p>Clothing</p> <p>Weight loss programs</p> <p>Access to pharmacotherapy</p> <p>Surgery</p> <p>Vitamins</p>	<p>+</p>		
<p>+ RR 1–2 (rare) but increased risk with obesity</p>				
<p>++ RR 2–3 (uncommon) screen if appropriate</p>				
<p>+++ RR >3 (common) screen most patients</p>				

PHQ-9: Patient Health Questionnaire-9; GAD: generalized anxiety disorder; CPAP: continuous positive airway pressure; PCOS: polycystic ovarian syndrome; LH/FSH: luteinizing hormone/follicle stimulating hormone; DHEAS: dehydroepiandrosterone; TSH: thyroid stimulating hormone; ECG: electrocardiogram; ECHO: echocardiogram; DVT/PE: deep venous thrombosis/pulmonary embolism; FIB-4 : Fibrosis-4, F: Female; M: Male; RR: Relative Risk; *Depending on patient population.