Table 1: Summary of Nutrition Interventions used in Obesity Management

Intervention	Outcomes/Impact		Advantages	Disadvantages
	Health and quality of life	Weight change		
Medical nutrition therapy by a registered dietitian (RD)	↓ 0.43% HgAlc ↓ 2.16 cm waist circumference ↓ 4.06 mg/dL cholesterol ↓ 8.83 mg/dL triglycerides ↓ 4.43 mg/dL LDL-C ↓ 7.90 mmHg systolic blood pressure ↓ 2.60 mmHg DSP	↓ 1.03 kg[6] For T2DM: ↓ 1.54 kg[8] For T2DM prevention: ↓ 2.72 kg[7]	Use RDs as an adjunct or stand-alone therapy option for improvements in cardiometabolic and weight outcomes	Access to RDs trained in obesity management may be limited; fee for services from private practice providers
Intensive lifestyle interventions	T2DM incidence 58%[51] ↓ 0.22 A1c, ↓ 1.9 mmHg systolic blood pressure, ↑ 1.2 mg/dL HDL-C[50] ↓ Cardiovascular disease (HR 0.67) and all-cause mortality (HR 0.74)[52] ↑ Remission of T2DM[53] ↓ Nephropathy incidence (HR 0.69)[54] ↓ Obstructive sleep apnea incidence[55] ↓ Depression (HR 0.85)[56]	↓ 8.6% 1 yr ↓ 6% 13.5 years[50]	Multi-modal approach with intensive counselling and strategies provides support to individuals for longer-term behaviour change and successful outcomes	Requires significant resources across multiple healthcare disciplines
Dietary pattern approaches				
Calorie restriction*	↓ Blood pressure, lipids, glucose[69,184,185] ↓ Bone density[75] ↓ Muscle strength[76] ↓ BMR[186]		Large initial weight loss[69,71,135,187]	Difficult to sustain, weight regain expected, long-term weight loss <5%[69,71,135,187]
Lower carbohydrate		↓ 8 kg at 6 mo; ↓ 6–7 kg at 1 year[9]		
Dietary fibre (25 g to 29 g)	Higher intakes: ↓ Cardiovascular disease mortality 15–30% ↓ Coronary heart disease, stroke incidence ↓ T2DM ↓ Systolic blood pressure ↓ Total cholesterol[97]	Higher intakes ↓ weight	Fibre supplements may help ↓ weight short-term[108,188–192]	
Low-calorie sweeteners	May ↓ weight and cardiometabolic disease[118,193]		As a replacement for sugar (e.g. SSB) may help ↓ weight[121]	Randomized control trials do not support use for obesity management[118]
Higher protein (25%–40% of calories from protein), no calorie restriction prescribed	↓ TG (-0.60 mmol/L)[80] Carb-to-protein ratio of 1.5:1 ↓ Chol, LDL[194] No change (with or without exercise) for HDL, FBG, fasting insulin[194]	↓ 0.39 kg BW ↓ 0.44 kg FM[80]	Greater satiety[195] Women with MetSyn had ↓ weight, ↓ fat mass with HP vs. low-fat/high carb[194]	No differences in other lipids or lean mass, attrition rates 30–40%[80]

Dietary pattern approaches				
Increased protein (1.1 g/kg or 30% protein intake), with calorie restriction	Short-term (12 +- 9.3 weeks): ↓ TG[195]	30% protein intake: No difference in wt loss, ↑ lean mass[196] ↓ Weight[197] 1.1 g/kg protein intake: short-term (12 +- 9.3 weeks): ↓ Weight ↓ Fat mass Less ↓ fat-free mass,[195]	Greater satiety[195]	Short term (12 +- 9.3 weeks)[195] Limited health data collected
Whey protein supplement (20–75 g/day, 2 weeks – 15 months)	↓ Cardiovascular disease risk factors (systolic blood pressure, DBP, HDL, TChol, glucose[91]	↓ Weight (mean diff -0.56 kg) ↓ Fat mass (mean diff -1.12 kg[91] ↓ Lean mass (mean diff -0.77 kg)	Benefits found with or without calorie restriction[91]	Lack of evidence to guide dose or length of time for use[91]
Increase protein to replace other macronutrients	Replace some carbohydrate ↓ Waist circumference over 5 years[198] Replace some fat No effect[198]	No effect on long-term weight outcomes[198]		
Lower fat		↓ 8 kg at 6 mo; ↓ 6–7 kg at 1 yr[9]		
Mediterranean	↓ A1C 0.45, ↓ TG 0.21 mmol/L, ↑ HDL-C 0.07 mmol/L[10] ↓ Cardiovascular events (HR 0.69–0.72)[11] ↓ T2DM risk 52%[12,13] ↑ Reversion of MetSx[14]	Little effect on weight or waist circumference[11]		
Vegetarian	↓ A1C 29%, ↓ LDL-C 0.12 mmol/L, ↓non-HDL-C 0.13 mmol/L[16] ↓ T2DM incidence (OR 0.726)[17] ↓ Coronary heart disease incidence (RR 0.72) ↓ Coronary heart disease mortality (RR 0.78)[18]	↓ 2.15 kg <6 mo[16]		Risk of vitamin/ mineral deficiencies (iron, calcium, zinc, vitamin B12, vitamin D)
Portfolio	↓ LDL-C 17% ↓ Apo B 15% ↓ Non-HDL-C 14%, ↓ CRP 32%, ↓ systolic blood pressure 1%, ↓ 10-yr coronary heart disease risk 13%[19]	No change		Individuals may find it difficult to meet the recommended food component targets**
Low-glycemic index	↑ HDL-C[199] ↓ T2DM risk[24] ↓ Coronary heart disease[25]	↓ 2.5 kg 18 months[200]		
Dietary Approaches to Stop Hypertension (DASH)	↓ CRP 1.01[28] ↓ LDL-C 0.20 mmol/L ↓ A1C 0.53% ↓ T2DM risk RR 0.82 ↓ Cardiovascular disease risk RR 0.80 ↓ Coronary heart disease risk RR 0.79 ↓ Stroke risk RR 0.81[27]	↓ 1.42 kg, ↓ waist circumference 1.05 cm in 24 weeks[26]		
Partial meal replacements*	↓ Blood glucose in DM[201] ↑ HRQOL[202] ↓ Systolic blood pressure 4.97 mmHg ↓ DBP 1.98 mmHg ↓ A1C 0.45% at 24 weeks[34]	↓ 2.37 kg ↓ Waist circumference 2.24 cm at 24 weeks[34]	Large initial wt loss	Wt regain 3 year weight loss < 5%[202]
Intermittent fasting		↓ 0.61 kg at 24 weeks[35]		

Food-based approaches				
Pulses	↓ FBG 0.82[37] ↓ LDL-C 0.17 mmol/L[38] ↓ Systolic blood pressure 2.25 mmHg[39] ↓ Coronary heart disease risk RR 0.86[40]	↓ 0.34 kg at 6 weeks[36]		
Vegetables and fruit	↓ DBP 0.29 mmHg[41] ↓ A1C 5.7%[42] ↓ T2DM risk 42%[43] ↓ Cardiovascular mortality HR 0.95[44]			
Nuts	↓ A1C 0.07% ↓ FBG 0.15 mmol/L[45] ↓ LDL-C 7.4%[46] ↓ Coronary heart disease risk HR 0.74			
Whole grains	↓ total cholesterol (TC) 0.12 mmol/L ↓ LDL-C 0.09 mmol/L[48]			
Dairy Foods (with calorie restriction)	↓ T2DM risk 42%[43]	↓ 0.64 kg BW ↓ 2.18 cm waist circumference ↓ 0.56 kg FM ↑ 0.43 kg lean mass[49]		
Non-dieting approaches				
Health at Every Size (HAES®)	↓ LDL-C ↑ Body image perceptions ↑ Quality of life (QOL) scores (depression) ↑ Eating behaviour scores ↓ Hunger ↑ Aerobic activity	No change in BMI or weight loss	↓ Weight bias	Evidence limited to women with BMI>25 or disordered eating patterns.
Mindful eating	↓ 3.1 mg/dl (↓ 0.2 mmol/L) in blood glucose[203] prevention of increasing FG over time	↓ 3.3% weight at post-treatment ↑ 3.5% weight in follow-up[154] ↓ 4.2–5.0 kg (4.3–5.1%) mean weight at 18 mo[203]	↓ Sweet food intake[204]	Lack of consistency for validated mindfulness tools

LDL-C: low-density lipoprotein C; BMI: body mass index; FG: fasting glucose; TC: total cholesterol; HDL; high density lipoprotein; A1C; kg: kilogram; BW: body weight; FM: fat mass; T2DM: type 2 diabetes

*These are typically combined with extensive behavioural modification support.

** The Portfolio dietary pattern = 1g to 3 g/day plant sterols (plant-sterol containing margarines, supplements), 15 g to 25 g/day viscous fibres (gel-forming fibres, such as from oats, barley, psyllium, legumes, eggplant, okra), 35–50 g/day plant-based protein (such as from soy and pulses) and 25 g to 50 g/day nuts (including tree nuts and peanuts).