Algorithm for Management of Obesity in Individuals with Down syndrome (DS)

Andrea Videlefsky[1], Thessa Hilgenkamp[2], Lauren Ptomey[3], Sarah Mann[4], Vibha Singhal[5]

1. Adult Disability Medical Healthcare Clinic, Atlanta, GA 2. Department of Physical Therapy, University of Nevada, Las Vegas, Las Vegas 3. Department of Internal Medicine, University of Kansas Medical Center, Kansas City, KS
4. Mann Method Physical Therapy and Fitness, Arvada, CO 5. Division of Endocrinology, Department of Pediatrics, University of California, Los Angeles, Los Angeles, California, USA

Background

Individuals with DS experience high rates of overweight and obesity, associated with multiple comorbidities and negative health outcomes. Availability of newer pharmacological and surgical treatments indicate a need for a standardized approach to the management of obesity in patients with DS. We aimed to adapt existing algorithms from the general population for management of obesity in individuals with DS.

Methods

Literature review explored current algorithms for the management of obesity in individuals with DS. Adaptations to existing general algorithms to formulate an algorithm for individuals with DS were supported by consensus discussions among experts in the multidisciplinary DSMIG Lifestyle and weight management group. The workgroup included experts with diverse credentials, including physicians (family physician, endocrinologist and obesity medicine specialist, neurodevelopmental pediatrician), nutritionists, exercise physiologists, and physical therapists well versed in managing DS population. From September 2023 to April 2025, the workgroup met monthly via conference calls to review the relevant research on obesity management and established best practices for managing obesity in the general population. They then adapted and developed an algorithmic approach to management of obesity in DS keeping in mind the published research and their own clinical experience in managing individuals with DS. In addition, the group shared the algorithm and obtained input from DSMIG conference attendees in 2023 and 2024 including individual medical providers who routinely prescribe obesity management medications for individuals with DS. Recommendations were developed through iterative clinical consensus, informed by extensive discussion and deliberation. Given the limited evidence-based guidance available for weight management in individuals with DS in primary care settings, the workgroup focused on generating practical, provider-oriented recommendations grounded in both clinical experience and existing literature.

Key Findings

No current algorithm for management of obesity in individuals with DS existed.

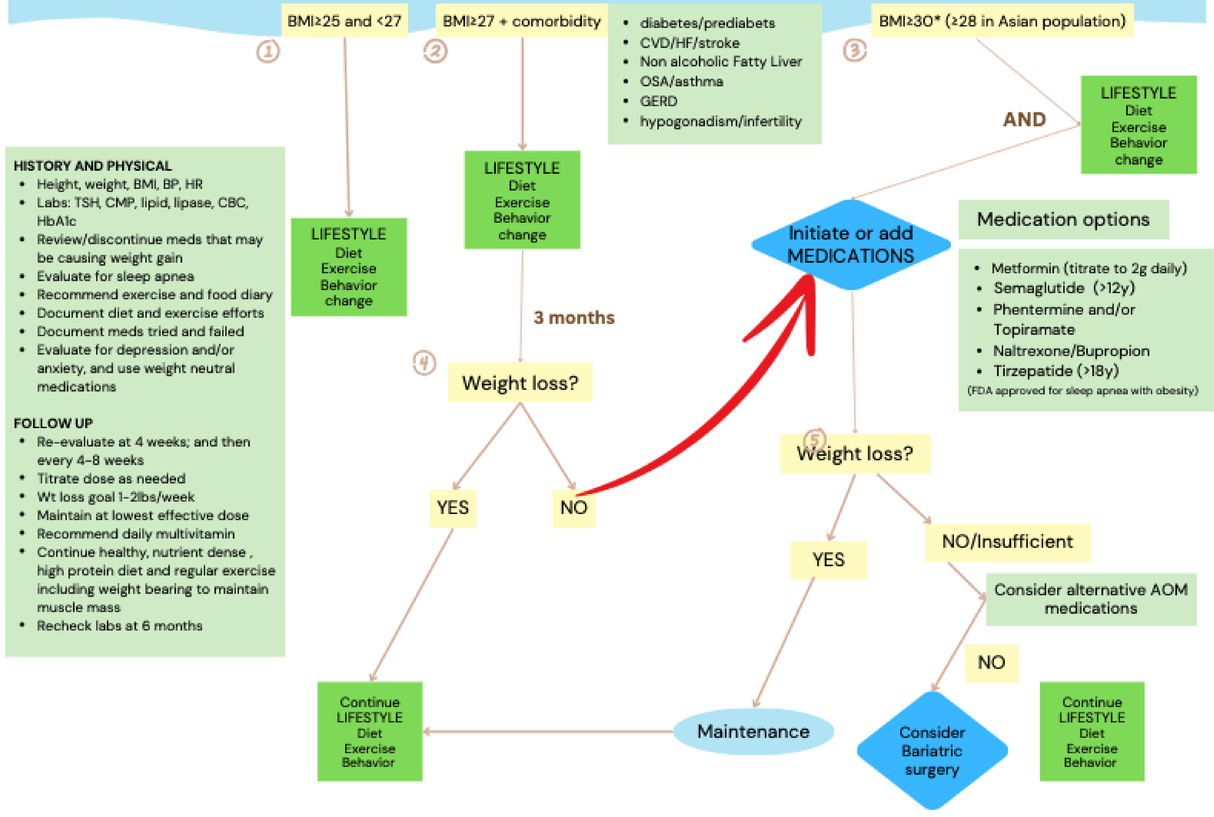
The proposed, adapted algorithm includes DS-specific recommendations for initial screening, evaluation, and treatment options.

It stresses that diet, exercise and behavioral changes remain critical for individuals at all stages.

It offers a step-wise approach for pharmacological and surgical options for individuals at different stages with regards to body mass index and comorbidities.

Detailed information sheets are being developed to provide additional support for these steps (i.e. medications and side effects, specific diet and exercise recommendations during treatment).

Algorithm for Obesity Management in Individuals with Down Syndrome



Information Sheet: Anti-obesity Medications

Medication (Class)	FDA approval	Form	Indication: Co-morbidities	Side effects	Contra-indications/Caution (all are contra-incicated in pregnancy and allergic reaction)
Metformin (Biguanide)	10+ years		Insulin Resistance, PCOS, anti-psychotics	diarrhea, abdominal discomfort	GFR<45ml/min; ketoacidosis
Semaglutide (GLP-1)	12+ years		Diabetes type 2, Obesity without Diabetes	nausea, vomiting, constipation, diarrhea, abdominal pain	medullary thyroid cancer, pancreatitis, gallbladder disease, multiple endocrine neoplasia syndrome 2
Phentermine (sympathomimetic stimulant)	16+ years		Injection averse, insurance coverage	increased heart rate, high blood pressure, insomnia, restlessness, and potential dependence	uncontrolled hypertension, hyperthyroidism, serious cardiovascular disease, glaucoma, within 14 days of MAO inhibitor
Topiramate (appetitie suppressant)	2+ years		Injection averse, seizures, headaches, anti-psychotics	fatigue, paresthesia, dizziness, suicidal thoughts, blurred vision, nausea, diarrhea, cognitive impairment	glaucoma, acute porphyria, metabolic acidosis, nephrolithiasis
Phentermine/Topiramate	12+ years		Injection averse, seizures, headaches, insurance coverage	increased heart rate, high blood pressure, insomnia, restlessness, and potential dependence	uncontrolled hypertension, hyperthyroidism, serious cardiovascular disease, glaucoma, within 14 days of MAO inhibitor
Tirzepatide (GLP-1/GIP)	18+ years		Sleep apnea with obesity, Diabetes type 2	nausea, vomiting, constipation, diarrhea, abdominal pain	medullary thyroid cancer, pancreatitis, gallbladder disease, multiple endocrine neoplasia syndrome 2
Naltrexone/Buproprion (Opioid antagonist/ Anti-depressant)	18+ years		Food cravings	headaches, dizziness, dry mouth, nausea, and constipation	seizures, uncontrolled hypertension, opioid use disorder, within 14 days of MAO inhibitor

GLP-1: glucagon like peptide 1 analog; PCOS: polycystic ovarian syndrome; GFR: glomerular infiltration rate; MAO: monoamine oxidase; GIP – gastric inhibitory polypeptide

Nutrition Recommendations while using GLP-1

GLP-1 medications can help with weight management and blood sugar control.
They reduce appetite and can cause nutritional deficiencies.
They may have side effects like nausea, vomiting, constipation and diarrhea.
The right nutrition plan is essential to support health, reduce side effects, and maintain strength.
Continue basic nutrition and exercise strategies and focus specifically on additional goals:

- ☑ Include Protein at every meal and with most snacks
- ☑ Eat small, frequent meals
- ☑ Drink 6-8 glasses of water daily
- ☑ Avoid greasy or fried foods
- ☑ Take a multivitamin, and Vitamin D supplements if indicated
- ☑ Increase physical activity and resistance training to support strength, balance, and muscle mass, and to prevent osteoporosis.

Exercise Recommendations while using GLP-1

Exercise	Description	Set up
15 Squat and reach		15 reps with sensory ball. Start standing, ball at your chest. Squat down, stand and reach. Tall and strong
15 Marches		15 marches each side, hold ball with two hands, at belly button. Slow and strong march to the middle
5 Hands and knees reaches with 3 second hold		Hands and knees Tummy tight Reach one arm forward hold 3 seconds Other side
10 Push-ups on knees		Hands by chest Knees bent Knees together Push-up Slow down
15 Clamshells		15 each side, head shoulders, hips, heels against the wall. Focus on side of glutes doing the work
5 Basic Gluteal Bridge, ball between knees		5 times with 5 second hold

Recommended exercises to combat loss of muscle mass for individuals with Down syndrome who are taking GLP1s

Progression options for each exercise:
Bodyweight only, Unweighted ball or pillow, Weighted ball or dumbbell, Increase repetitions or time.

Purpose of exercises:
Foundational strength, hip and lower extremity strength,
core and trunk strength, balance, coordination.

Discussion

The algorithm for evaluation and management of obesity in individuals with DS serves as a guide to helping clinicians better understand treatment options and interventions and improving success.

The algorithm needs further research and validation. We plan to initiate a longitudinal registry/repository of treatment outcomes in patients with DS and obesity beginning with building a shared dataset.

We recommend adding obesity management to existing collaborative efforts through DSMIG partners and developing surveys and focus groups to gather data and input from patients and their caregivers.

References

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2. Tania P. Markovic, Joseph Proietto, John B. Dixon, Georgia Rigas, Gary Deed, Jeffrey M. Hamdorf, Erica Bessell, Nathalie Kizirian, Sofianos Andrikopoulos, Stephen Colagiuri, The Australian Obesity Management Algorithm: A simple tool to guide the management of obesity in primary care, Obesity Research & Clinical Practice, Volume 16, Issue 5, 2022, Pages 353-363.

DSMIG-USA Down Syndrome Medical Interest Group-USA

VS – speaker for Pri-Med
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