Metabolic Syndrome in Individuals with ASD/IDD

NM START PROGRAM

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START Model

The START (**S**ystemic-**T**herapeutic-**A**ssessment-**R**esources-**T**reatment) model is an evidence-informed model of integrated community crisis prevention & intervention services for individuals ages 6 and older with intellectual and developmental disabilities and mental health needs.

START was first developed in 1988 by Dr. Joan B. Beasley and was cited as a best practice in the 2002 US Surgeon General's report and by the National Academy of Sciences in 2016.

The **National Center for START Services** at the UNH Institute on Disability oversees the development, measurement and quality of START programs across the country.

Objectives

Questions START team would like to explore:

1. What is the prevalence of metabolic disorder in individuals with disabilities? If there is a higher prevalence rate, is there a known reason? Are there certain metabolic disorders that are seen more than others in individuals with disabilities?
2. Are there concerns that you have when you are supporting an individual with a disability with a metabolic disorder? Communication? Medication Interactions?

MetS Metabolic Syndrome

- Individuals with Intellectual and Developmental Disabilities (IDD) experience MetS at much higher rates (around 22.5 %) compared to general population.

Metabolic Syndrome

- Waist circumference of >=40 inches for men or >=35 inches for women
- Triglyceride level of 150 mg/dl or greater , or use of medication for mgt
- High-density lipid cholesterol (HDL-C) < 40 mg/dL men or <50 mg/dl women
- Blood pressure : 130/85 or higher, or use of antihypertensive
- Glucose impairment: fasting blood glucose 100-125 mg/dl
- HbA1c level between >5.7% or use of medication for elevated glucose

Why Increased prevalence?

- Individuals with IDD have obesity rates nearly twice those of general population
- ASD: obesity driven by low activity, selective eating , and medication side effects
- Down Syndrome: obesity linked to hypotonia, hypothyroidism, and reduced metabolism
- Prader-Willi syndrome: obesity due to hyperphagia and hypothalamic dysfunction.

  General IDD: Medications that may be related to obesity and MetS

Atypical Antipsychotics and MetS

- Stimulate appetite and fat deposition
- Impair insulin secretion and promote insulin resistance leading to hyperglycemia
- Causes unfavorable changes in cholesterol and triglycerides
- Through hypothalamus affects neuropeptides and energy balance

Risk spectrum for causing Met S

Highest: Olanzapine(Zyprexa)

Clozapine(Clozaril)

Moderate: Quetiapine(Seroquel)

Risperidone(Risperdal)

Paliperidone(Invega)

Lower: Aripiprazole(Abilify)

Ziprazidone (Geodon)

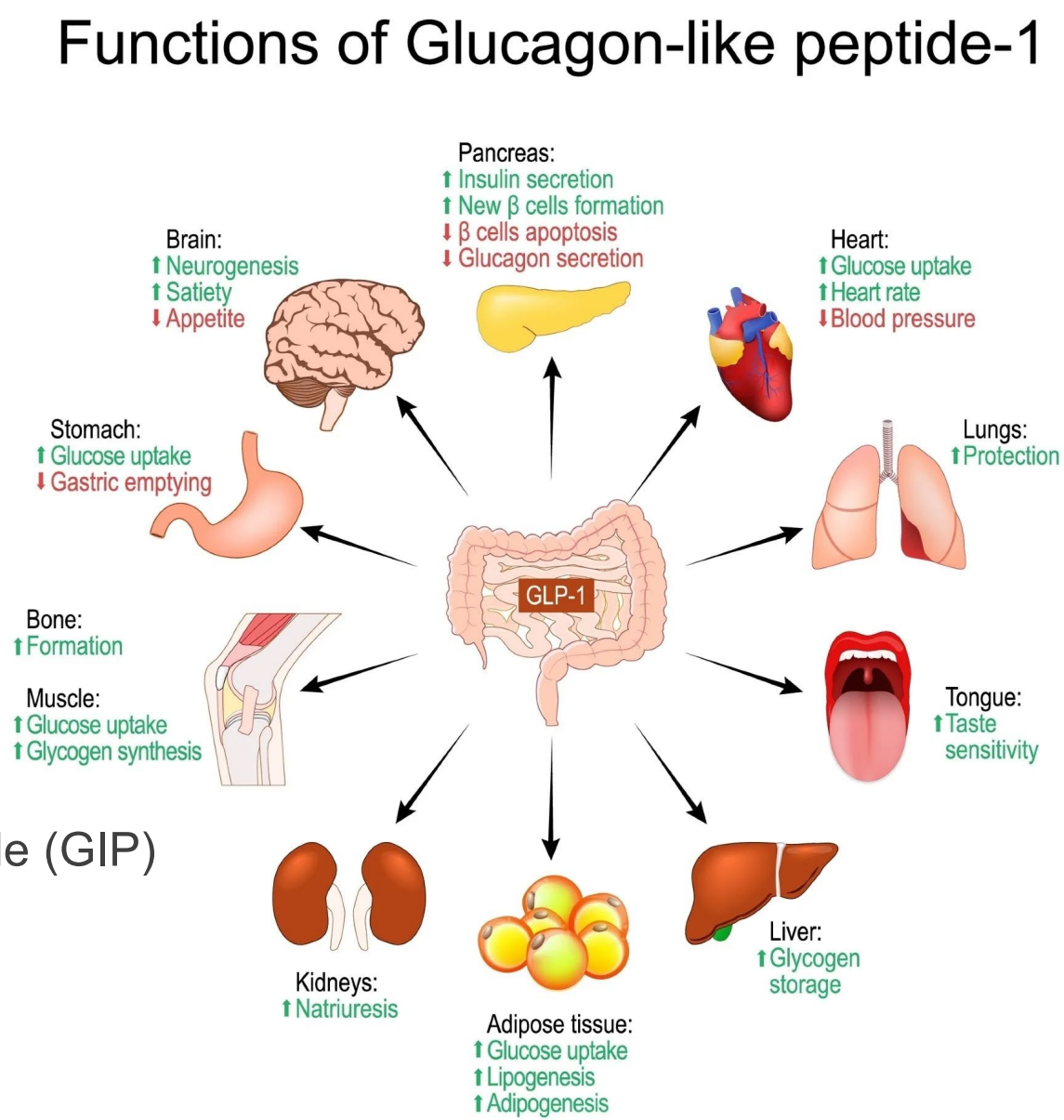
Lurasidone(Latuda)

Medications prescribed to address the Metabolic burden of psychotropic medications.

- Metformin: lowers blood glucose and decreases insulin resistance (and tends not to cause hypoglycemia).
- Metformin sometimes causes modest weight loss making it an effective choice for patients with Type II Diabetes. If added when starting an atypical antipsychotic , it can help with decreasing weight gain.

GLP-1 / GIP

- Glucagon-like peptide-1 (GLP-1)
  - Naturally occurring gut hormone
  - Involved in blood sugar regulation
  - Slows digestion
  - Signals fullness
- GLP-1 agonists / Medications:
  - Semaglutide
    - Ozempic, Rybelsus, Wegovy
  - Dulaglutide
    - Trulicity
  - Liraglutide
    - Victoza, Saxenda
- Glucose-Dependent Insulinotropic Peptide (GIP)
  - Naturally occurring gut hormone
  - Involved in blood sugar regulation
- GLP-1/GIP agonist / Medications
  - Tirzepatide
    - Monjaro, Zepbound



GLP-1 Medications & ASD / IDD

- Current opinions
  - Safe and effective
  - Limited interactions with psychiatric medications
    - Does slow gastric emptying which may need small dosage adjustments
  - Likely lower overall weight loss than patients without ASD/IDD
- Case reports show promise
  - Improved binge eating
  - Decreased weight
  - Improved aggression
- Long term and large trials
  - None currently available

GLP-1 Medication Side Effects

Common

Nausea

Diarrhea / Constipation

Vomiting

Abdominal Pain / Discomfort

Headaches

Fatigue

Uncommon

Pancreatitis

Gallstones / Gallbladder function

Hypoglycemia

Allergic Reactions

Thirst Suppression / Kidney function

Medullary Thyroid Carcinoma?

Partial List of Proteins & Hormones Involved in Weight Regulation

Table 2.1 Partial list of proteins involved in weight regulation: functions are complex, context dependent, and not well defined for many mediators; general effects in majority of studies listed below

Mediator	Primary source	Satiety	Glucose homeostasis	Immunity
Adipokines				
Adiponectin	Adipocytes	Minimal satiety effects	Insulinomimetic	Anti-inflammatory
Apelin	Adipocytes, brain, heart, kidney, lung	Probably anorexigenic, data sparse	Inhibits glucose-induced insulin secretion	Anti-inflammatory
CCL2	Adipocytes	Unknown	Diabetogenic, likely through proinflammatory properties	Proinflammatory, macrophage homing
Leptin	Adipocytes	Anorexigenic, hypothalamic leptin resistance in obesity	Generally insulinomimetic	Generally proinflammatory
Lipocalin 2	Adipocytes, monocytes, macrophages	Unknown	Diabetogenic via proinflammatory effects	Pro- and anti-inflammatory effects
Plasminogen activator inhibitor-1 (PAI-1)	Adipocytes	Unknown	Probably diabetogenic—causality not well established	Unknown
Resistin	Adipocytes, macrophages	Probably anorexigenic	Diabetogenic via proinflammatory effects	Proinflammatory
Retinol-binding protein 4 (RBP-4)	Adipocytes, hepatocytes, macrophages	Unknown	Diabetogenic	Proinflammatory
Secreted frizzled-related protein 5 (SFRP5)	Adipocytes, pancreas	Unknown	Insulinomimetic	Anti-inflammatory, suppresses Wnt signaling
Visfatin	Adipocytes	May induce satiety, data conflicting	Insulinomimetic	Proinflammatory

Bariatrics

The medical field focused on managing obesity

- Baros – Weight (Greek)
- iatros – Physician (Greek)
- -ics: Physician (English)

Multidisciplinary Care

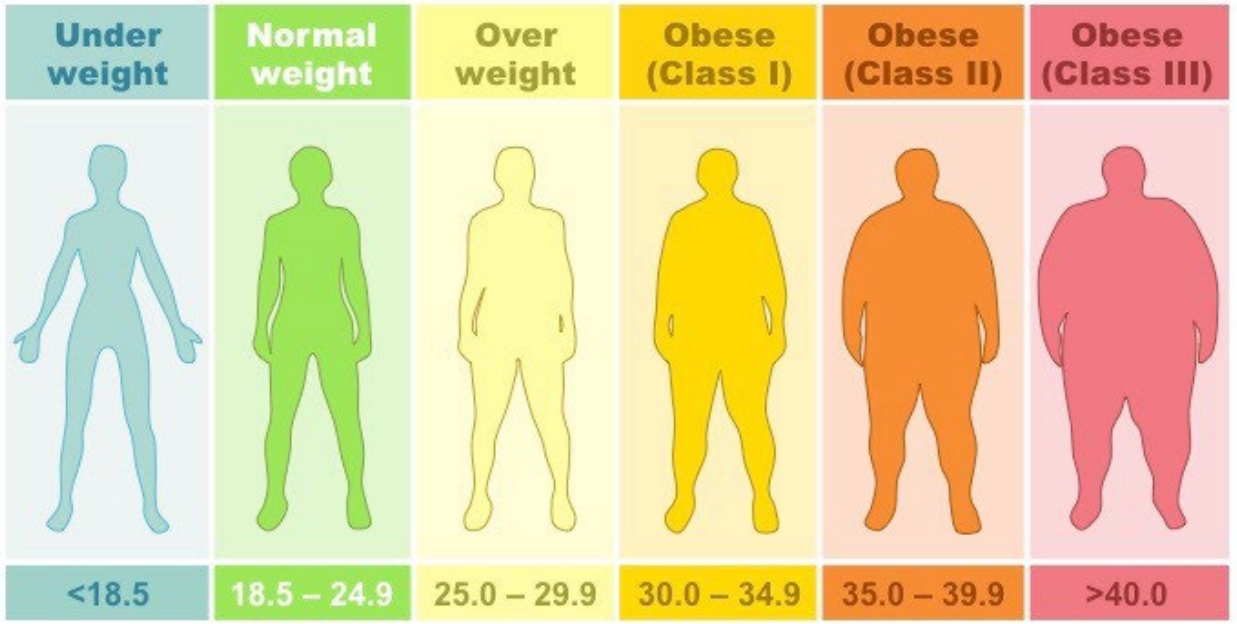
- Dietary / Nutrition
- Psychological
- Medical
- Surgical

Obesity & Body Mass Index (BMI)

BMI = Weight (kg) / Height (m^2)

<18.5	Underweight
18.5-25	Normal weight
25-30	Overweight
30-35	Obese, Class I
35-40	Obese, Class II
>40	Obese, Class III

41.9% of the US population has obesity (2020)
19.7% of adolescents have obesity(2020)



Who Qualifies for Bariatric Surgery

BMI >40 kg/m^2 (Class III Obesity)

BMI >35 kg/m^2 (Class II Obesity)

- With an associated medical comorbidity worsened by obesity

Failed dietary therapy

Psychologically stable without alcohol dependence, nicotine usage or illegal drug use

Knowledgeable about the operation and its sequelae

Motivated individual

Medical problems not precluding probable survival from surgery

Obesity Related Comorbid Conditions

- Hypertension
- Hyperlipidemia
- Diabetes
- Sleep apnea
- Obesity hypoventilation
- Treatable joint disease / Arthritis
- Nonalcoholic fatty liver disease
- Gastroesophageal reflux (GERD)
- Pseudotumor cerebri
- Asthma
- Venous stasis disease
- Urinary incontinence
- Polycystic ovarian syndrome

Bariatric Surgery & ASD / IDD

Overall, safe and effective

May have less weight loss than patients without ASD / IDD

Requires robust family / caregiver support

Ensuring patient understanding of procedure and commitment is crucial
- May not be possible

Autism Spectrum Disorder & Down Syndrome
- Outcomes similar to patients without ASD / Down Syndrome
- Requires a very individualized approach

Prader-Willi Syndrome
- Highly variable outcomes
- Potentially increased complications due to hyperphagia
- Many studies show increased long-term weight regain

UNM Bariatrics

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