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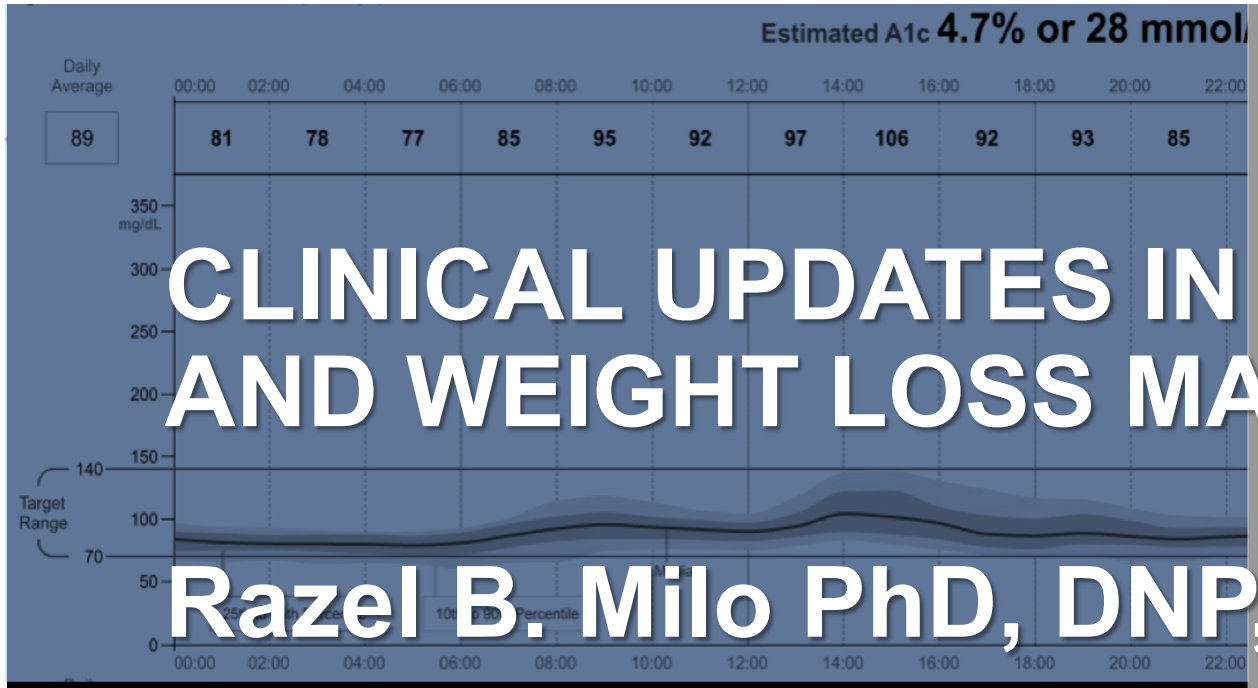

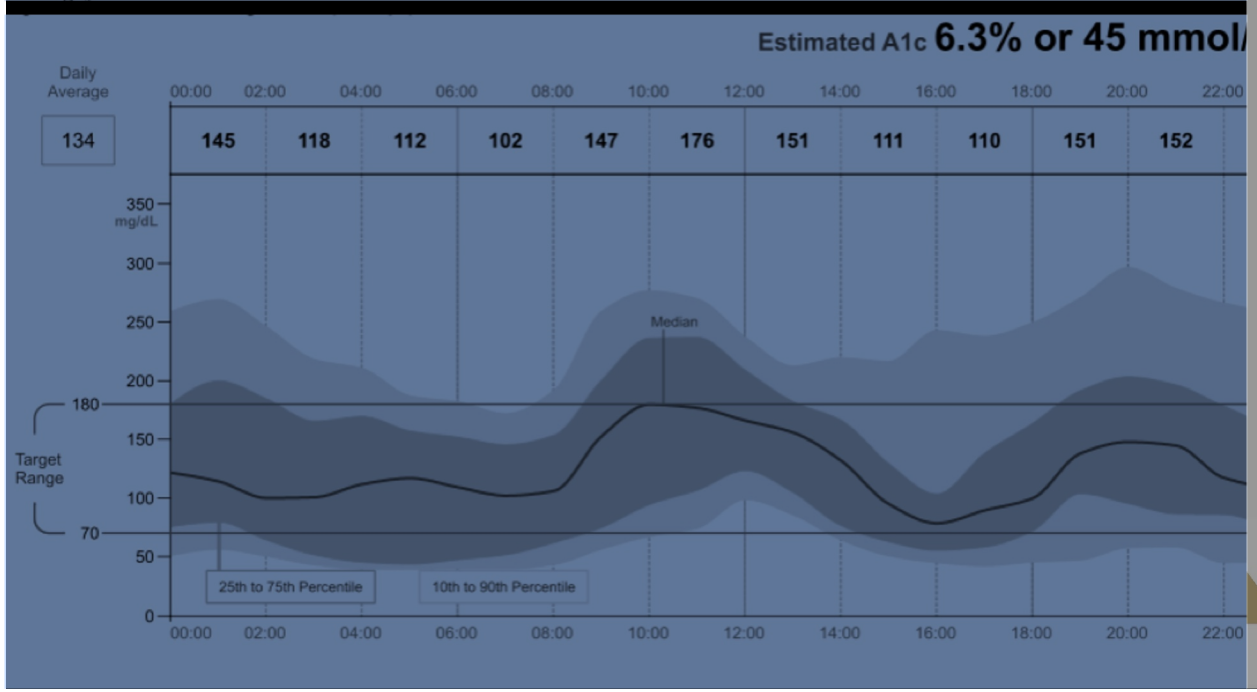

CLINICAL UPDATES IN DIGITAL DIABETES AND WEIGHT LOSS MANAGEMENT

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DIABETES TECHNOLOGY
STANDARDS OF MEDICAL CARE IN DIABETES - 2024

- Diabetes devices should be offered to people with diabetes
- Continuous glucose monitoring (CGM) should be offered to patients with type 1 diabetes early in the disease
- Consider establishing competencies based on role in practice settings (providers and staff) working with patients with diabetes
- Type(s) and selection of devices should be individualized
- Ensure patient and caregiver received initial and ongoing training and education (in person or remotely)
- People who have been using CGM, continuous subcutaneous insulin infusion (CSII), and/or automated insulin delivery (AID) for diabetes management should have continued access across third-party payers
- Students must be supported at school in the use of diabetes technology

(American Diabetes Association Professional Practice Committee, 2024)

INDICATIONS FOR USE OF INSULIN PUMP IN PEDIATRICS

1. Recurrent severe hypoglycemia	*2. Wide fluctuations in glucose levels regardless of HbA1c*	*3. Suboptimal diabetes control (i.e., HbA1c exceeds target of 7.0% or TIR is <70%)*	*4. Microvascular complications and/or risk factors for macrovascular complications*
5. Targeted metabolic control but insulin regimen that compromises lifestyle	*6. Young children and especially infants and neonates*	*7. Children and adolescents with pronounced dawn phenomenon*	*8. Children with needle phobia*
9. Pregnant adolescents, ideally preconception	*10. Ketosis prone individuals*	*11. Competitive athletes*	*12. Contraindications to pump therapy: Preference of the person with diabetes not to use technology, significant skin irritation/allergy making pump/sensor wear difficult*

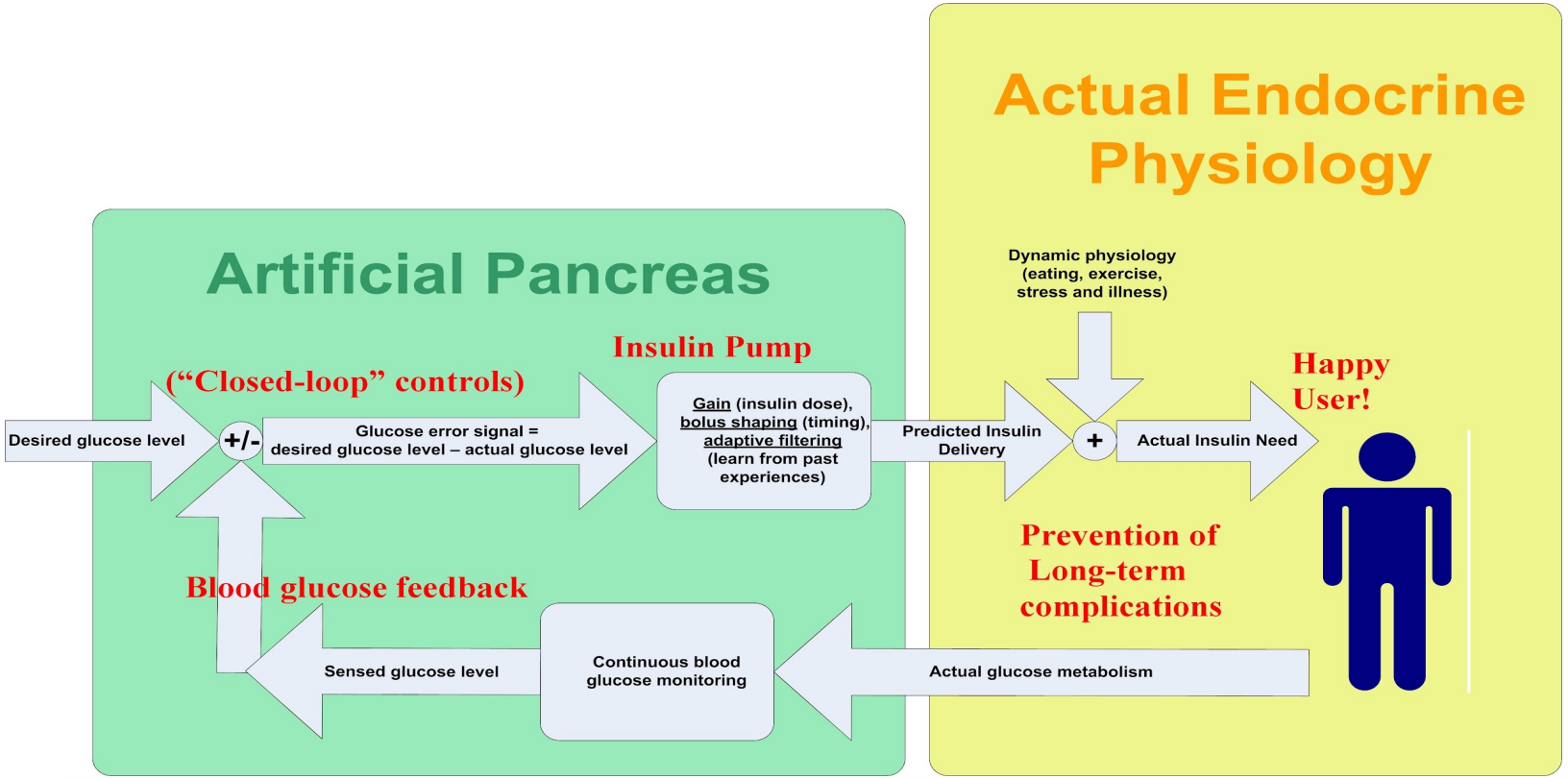
(Sherr et al., 2022)

AUTOMATED INSULIN DELIVERY (AID) STUDIES

AID System	Study Duration/Design	Study Population	Glycemic Outcomes (A1C)	Difference from baseline (A1C)
Medtronic 670G	3 mos. Single arm	N=46; Age 4.6 (1.4)	7.5% (0.6%)	-0.5%
Omnipod 5	3 mos. Single arm	N=80; Age 4.7 (1)	6.9% (0.7%)	-0.55%
Medtronic 670G	3 mos. Single arm	N=105; Age 10.8 (1.8)	7.5% (0.6%)	-0.4%
Omnipod 5	3 mos. Single arm	N=112; Age 10.3 (2.2)	6.99% (0.63)	-0.71%
Medtronic 670G	3 mos. Single arm	N=30; Age 16.5 (0.9)	7.1% (0.6%)	-0.6%
Medtronic 670G	3 mos. Single arm	N=124; Age 21.7	6.9% (0.6%)	-0.5%
Omnipod 5	3 mos. Single arm	N=128; Age 36.9 (13.9)	6.78% (0.68%)	-0.38%

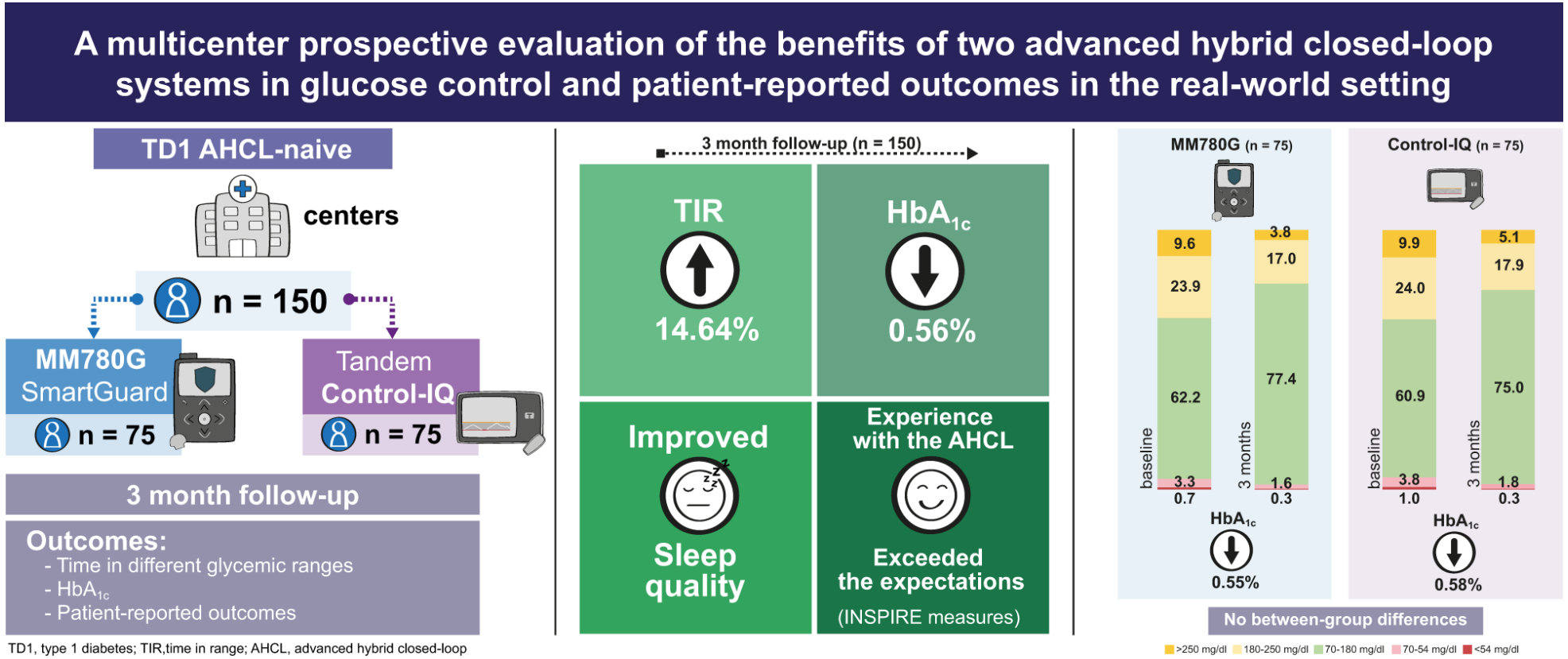
(Sherr et al., 2022)

CLOSED LOOP SYSTEM

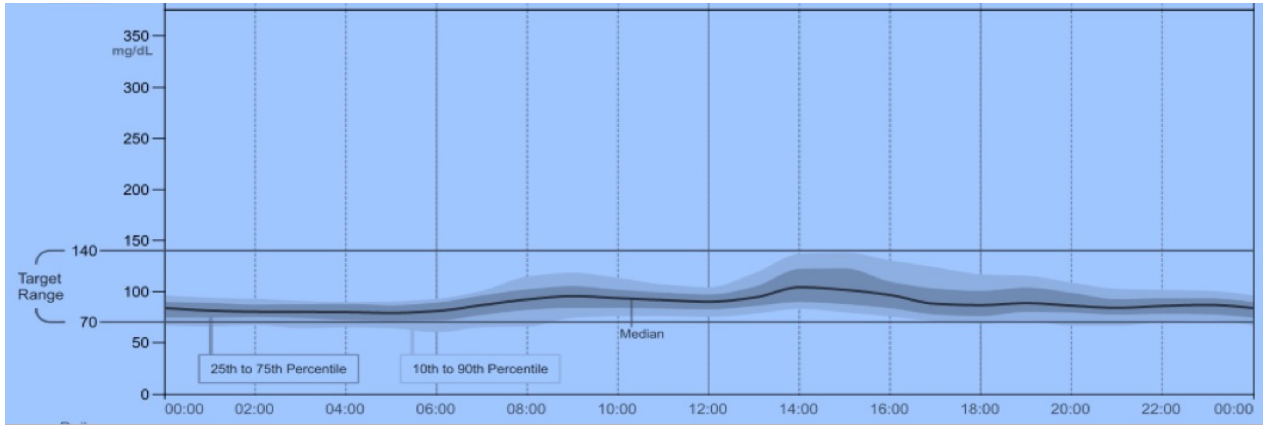


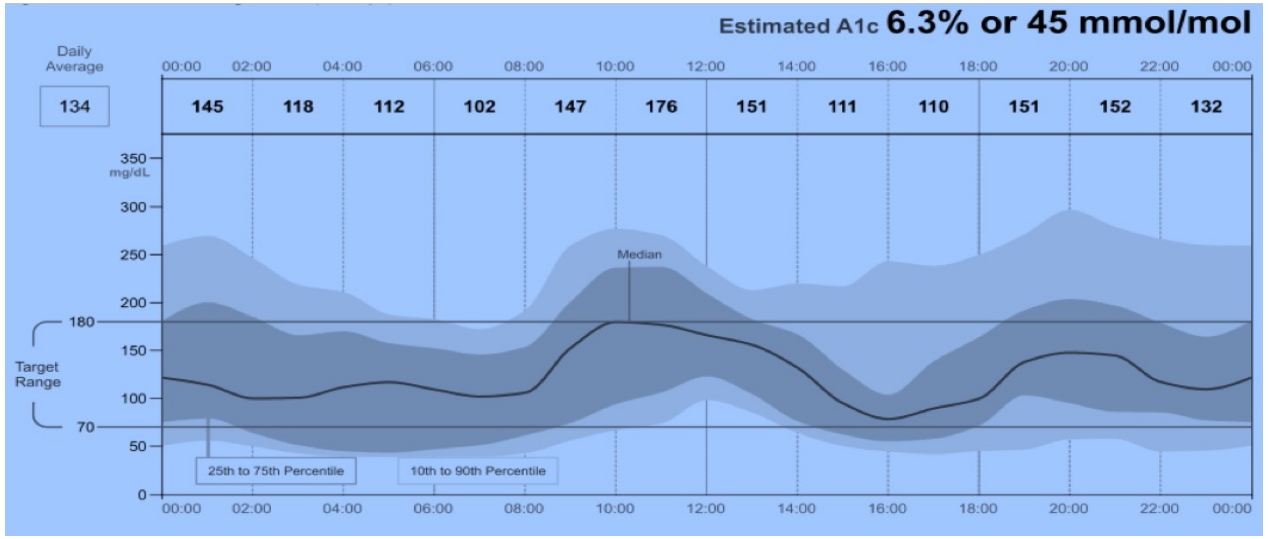
From: **A Multicenter Prospective Evaluation of the Benefits of Two Advanced Hybrid Closed-Loop Systems in Glucose Control and Patient-Reported Outcomes in a Real-world Setting**

Diabetes Care. 2023;47(2):216-224. doi:10.2337/dc23-1355



CONTINUOUS GLUCOSE MONITORING (CGM)





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Calculate	Calculate each dose based on current blood sugar level, carbohydrate amounts, meal size, active insulin, and settings as prescribed.
Deliver	Deliver accurate half-unit doses.
Help	Help prevent skipped or missed doses.
Do	Do the math when figuring out how to dose for a meal or correct a high blood sugar reading.
Keep	Keep track of the time and amount of each dose and remind the user when it's time for the next one.
Notify	Notify the user when insulin has expired or exceeded its temperature range, so the user can replace the cartridge.
Send	Send BG data to health care team whenever needed.
Work	Work with the user's smart phone or watch and popular diabetes data tracking platforms.

SMART INSULIN PEN

(American Diabetes Association, n.d.)

DIABETES APPS

- mySugr
- MyFitnessPal
- One Drop
- Dario

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WEIGHT MANAGEMENT

OBESITY TREATMENT REALITY

- Obesity biochemistry is different
- Not just “willpower” but also other factors
- Many genetic factors are not well studied
- Known as the “Disease of Diseases”

OBESITY PREVENTION

Increased in obesity prevalence in U.S.

Most insurance companies do not pay for obesity treatment itself, just the sequelae

For every $1 spent on health promotion, $45 was spent on consumer advertising by the food industry

ASSOCIATED DISEASE RISK WITH INCREASED BMI

CLASSIFICATION	BMI (kg/m^2)	RISK
Underweight	< 18.5	Increased
Normal	18.5 – 24.9	Normal
Overweight	25.0-29.9	Increased
Obese I	30.0-34.9	High
Obese II	35.0-39.9	Very High
Obese III	>= 40	Extremely High

WAIST / HIP = RATIO

Abdominal Fat

Waist measurement (cm or in): Measure at midpoint (lower border of rib cage and upper border of the pelvis)

Hip Measurement (cm or in): Measure from the widest point of the buttocks and hips

HIP – WAIST RATIO HEALTH RISK

Health Risk	Women	Men
Low	<= 0.80	<= 0.95
Moderate	0.81-0.85	0.96-1.0
High	>= 0.86	>= 1.0

DIET AND WEIGHT LOSS

Participant's Choice:

Mediterranean Diet (MD) (n=68)

Intermittent Fasting (IF) (n=136)

Paleolithic Diet (PD) (n=46)

Randomized:

Control (n=48)

Daily Self-Weighing (n=51)

Hunger Training (n=50)

MyFitnessPal App (n=50)

Brief Support (n=51)

12 months Evaluation:

Continued weight loss with IF (mean change -4 kg) & MD (mean change – 2.8 kg

Decreased in body fat, visceral fat, waist circumference, and DBP

IF & MD → Decreased in SBP (-4.9 & -5.9 mm Hg)

MD → reduction in A1C (-0.8 mmol/mol)

(Jospe, Roy et al., 2020)

PHARMACOLOGIC AGENTS (ORALS)

Phentermine: start: ½ of 37.5 mg PO QD, inexpensive, side-effects (SEs) (palpitations, chest pain, SOB, dry mouth, constipation, etc.)

Orlistat (Xenical or Alli): Xenical (requires rx, 120 PO mg TID, SEs: GI, vitamin deficiency, hepatoxicity, nephrotoxicity); Alli (OTC, 1 cap PO with fat-containing meal; max: 3 caps QD; SEs: GI, hepatoxicity)

Metformin: greater weight loss than other hypoglycemics, start: 500 mg PO BID, increase to 875 mg BID, SEs: GI, hepatoxicity

Qsymia: *Phentermine/Topiramate*, start: 3.75 mg IR / 23 mg ER PO qam x 14 days, then increase to 7.5 mg / 46 mg PO qam; Max 15 mg / 92 mg QD; SEs (CV, abuse, cognitive, insomnia, HA, nausea, etc.)

PHARMACOLOGIC AGENTS (INJECTIBLES)

Liraglutide (Saxenda): chronic obesity; start: 0.6 mg SC QD x 1 week, increase by 0.6 mg/day qweek; Max dose: 3 mg/day; SEs: RF, GI, pancreatitis, cholelithiasis, etc.; Cost: $1386 (five 3 ml/pens)

Semaglutide (Wegovy): chronic obesity; start 0.25 mg SC qweek x 4 weeks, then 0.5 mg SC qweek x 4 weeks, then 1 mg SC qweek x 4 weeks, then 1.7 mg SC qweek x 4 weeks, then may increase to 2.4 mg SC qweek; SEs: RF, GI, pancreatitis, cholelithiasis, etc.; Cost: $1386 (1 carton, 4 pens)

MANAGING GI SIDE-EFFECTS WITH GLP1

01

Make patient aware GI SEs (N/V most common)

02

They will feel full with this medication, challenging their satiety will make their symptoms worse

03

If N/V or other SEs does not resolve with adjusting food intake, titrate medication down, and re-evaluate

04

If N/V persist evaluate patient for possible eating disorder, for other GI SEs consider referring to a gastroenterologist

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CLINICAL TRIALS FOR WEIGHT LOSS

GLP-IRAs SYSTEMATIC REVIEW

Liraglutide: change in body weight (BW) -4.12 kg; BMI: -1.62 kg/m^2; waist circ: -3.29 cm; waist-to-hip ratio: -0.010; Total body fat (BD): -1.28%

Semaglutide: change in BW -10.48 kg; BMI: -4.07 kg/m^2; waist circ: -7.80 cm; waist-to-hip ratio: -0.011

Placebo: change in BW -5.71 kg; BMI: -2.71 kg/m^2; waist-to-hip ratio: -0.011

Lifestyle modification: change in BW -4.74 kg; BMI: -1.84 kg/m^2; waist circ: -3.5 cm

Metformin: change in BW -3.3 kg; BMI: -1.5 kg/m^2; waist circ: -3.9 cm; Total BF: 0.225

(Liu, Y., et al., 2023)

GIP AND GLP1 “TWINCRETIN”

- SURPASS trial's goal is to collect long-term data on CV safety as well as the efficacy of tirzepatide
- Multifactorial intervention to minimize CV morbidity and mortality
- Recommend the choice of anti-hyperglycemic therapy that targets the degree of hyperglycemia and the presence or absence of CV disease, renal disease, and obesity
- FDA Guidance on anti-hyperglycemia therapy should reduce A1C with favorable CV outcomes

(Min & Bain, 2021)

Case Study

Marion is a 40-year-old female with a three-year history of Type 2 DM. She wants to lose weight and thinks metformin might be causing her weight gain of 10 pounds.

PMH: HTN, chronic obesity

Current medications include lisinopril 20 mg QD and metformin 1000 mg BID. She is on Medicaid.

VS: BP = 120/76, HR = 85, BMI = 35

Her most recent lab was 2 months ago:

- A1C = 8.5%
- Creatinine = 0.82 mg/dL
- EGFR = 100 mL/min/BSA
- LDL = 150 mg/dL
- HDL = 47 mg/dL
- Triglyceride 80 mg/dL

How would you manage this patient?

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