2026 AAOHN NATIONAL CONFERENCE

Pharmacology of GLP-1 Receptor Agonists

Understanding drug mechanisms for improved nursing care

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Viking Yachts and Valhalla Boatworks

Self Insured
1,600 Employees
2 NJ Locations

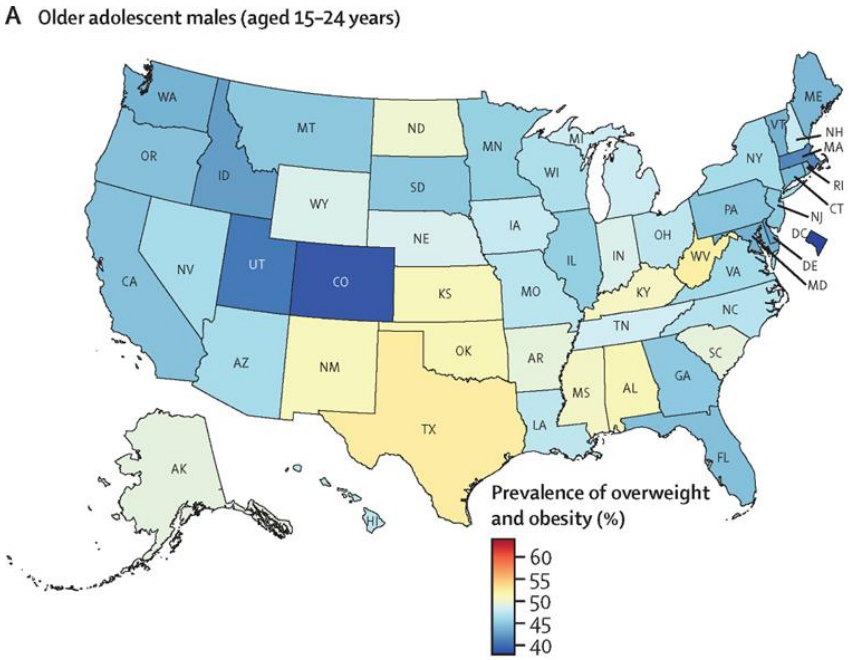
Learning Objectives

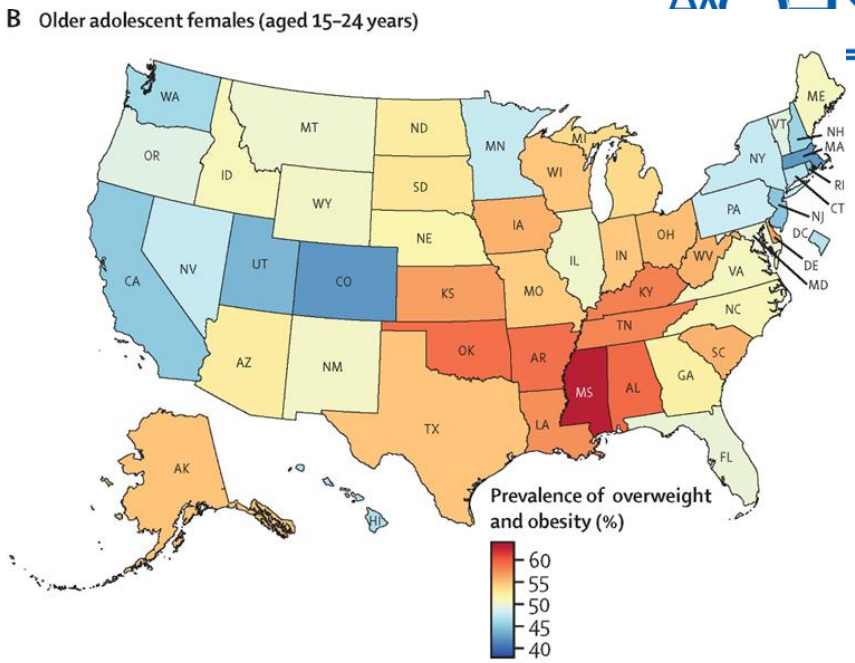
- Explain the impact of obesity
- Explain incretin physiology
- Describe mechanisms of GLP-1 medications
- Identify common GLP drugs and indications
- Recognize adverse effects and contraindications
- Discuss nursing considerations and patient education

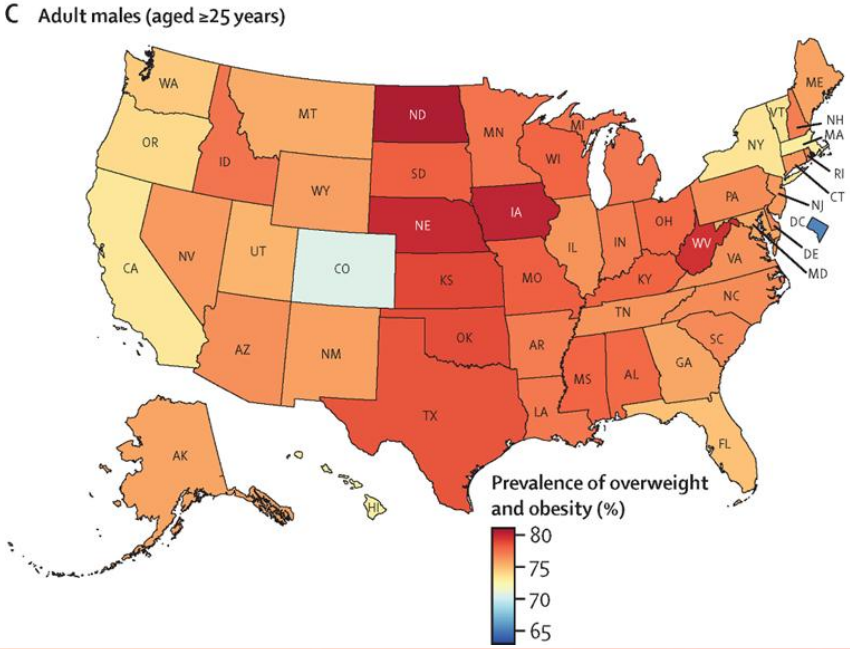
Obesity

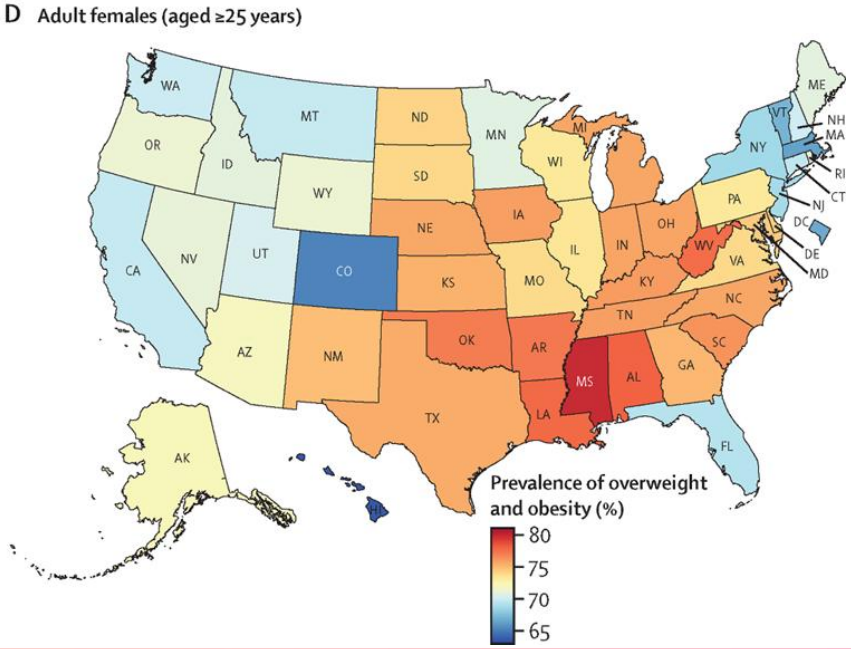
- Obesity is a Medical Condition
  - ***We need to treat it like one***
- Excess body weight accumulated in the form of fat
  - Leads to multiple severe health conditions
- Nationwide public health problem

Obesity in the US









Body Mass Index (BMI)

BMI Formula

thecalculatorsite.com

METRIC

BMI = weight (kg) / [height (m)]^2

IMPERIAL

BMI = 703 x weight (lbs) / [height (in)]^2

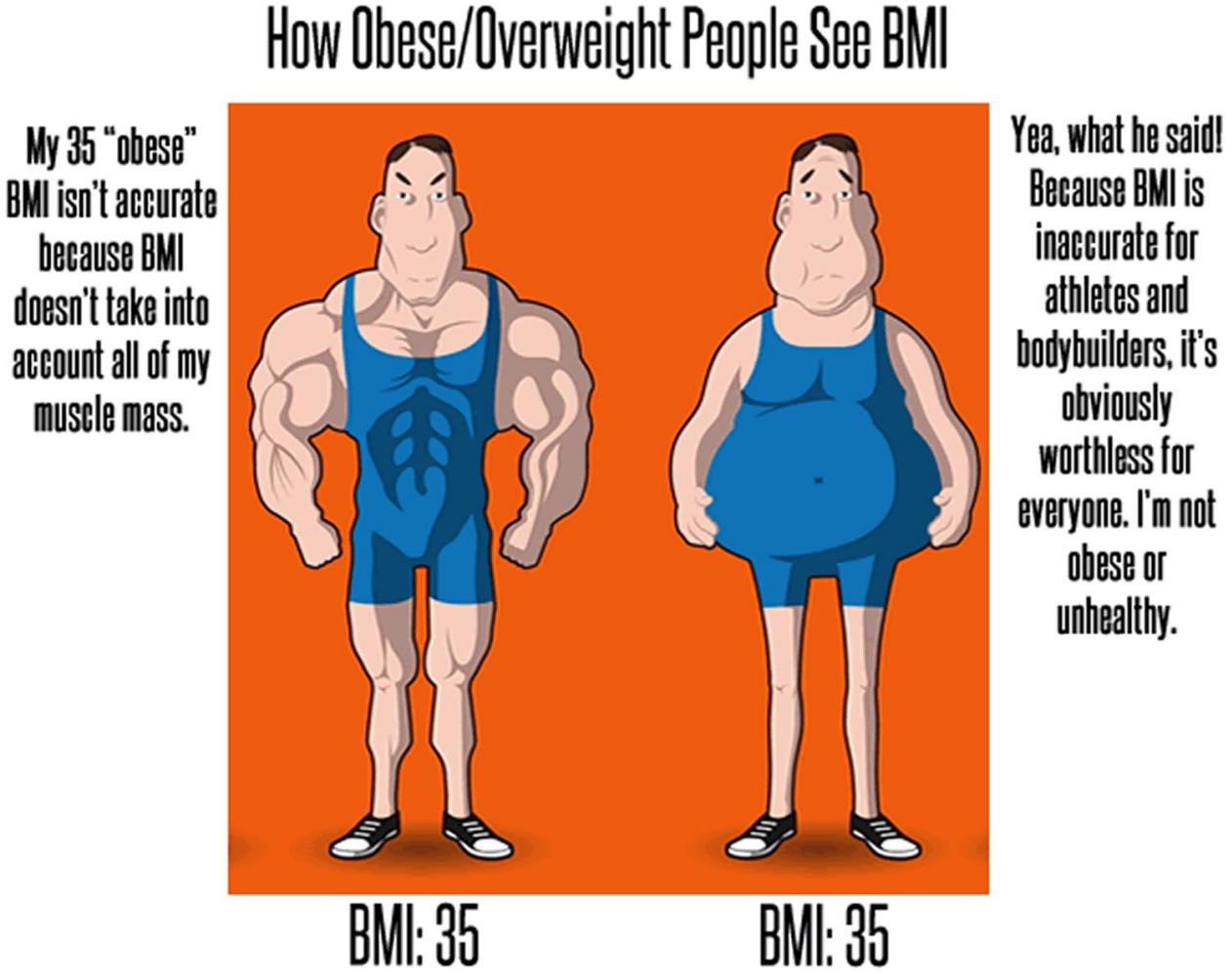
How is BMI interpreted for adults?

For adults aged 20 years and older, BMI categories are defined the same regardless of sex or age.

BMI	BMI Category
Below 18.5	Underweight
18.5–24.9	Healthy Weight
25.0–29.9	Overweight
30.0 and Above	Obesity

BMI Limitations

- No distinction between excess fat, muscle or bone mass
- Does not consider gender
- Body fat distribution
  - Central Obesity is more predictive of poor outcomes



Obesity by the numbers

Obese workers are 25 to 68% more likely to experience injuries than normal weight workers

Prevalence of work-site injuries and relationship between obesity and injury among U.S. workers: NHIS 2004–2012, , - PMC (nih.gov)

Obesity by the numbers

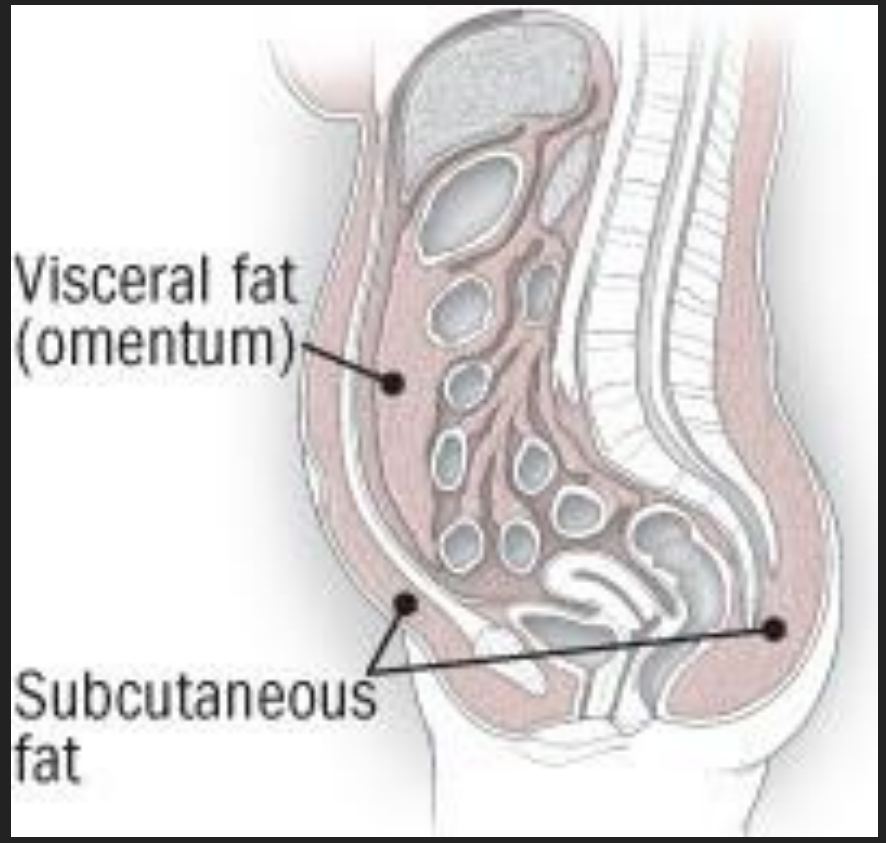
Over 10 years:
EE BMI ≥40
3x
economic burden
of an
EE BMI 30-34.9

Prevalence of work-site injuries and relationship between obesity and injury among U.S. workers: NHIS 2004–2012, , - PMC (nih.gov)

Visceral Fat

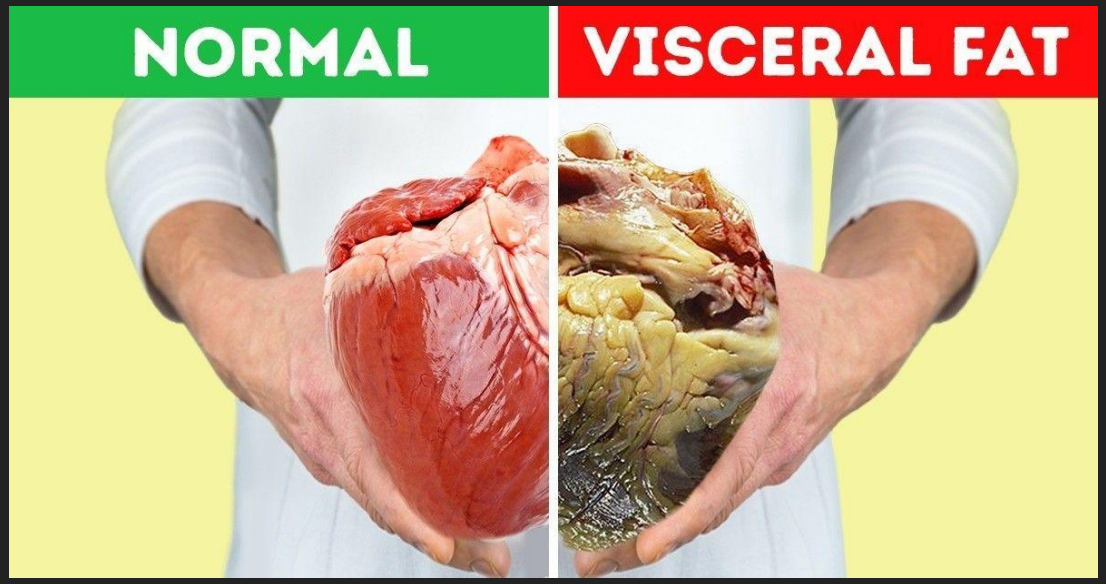
Increase risk for:

- Cardiovascular disease
- Dementia
- Asthma
- Breast cancer
- Colorectal cancer

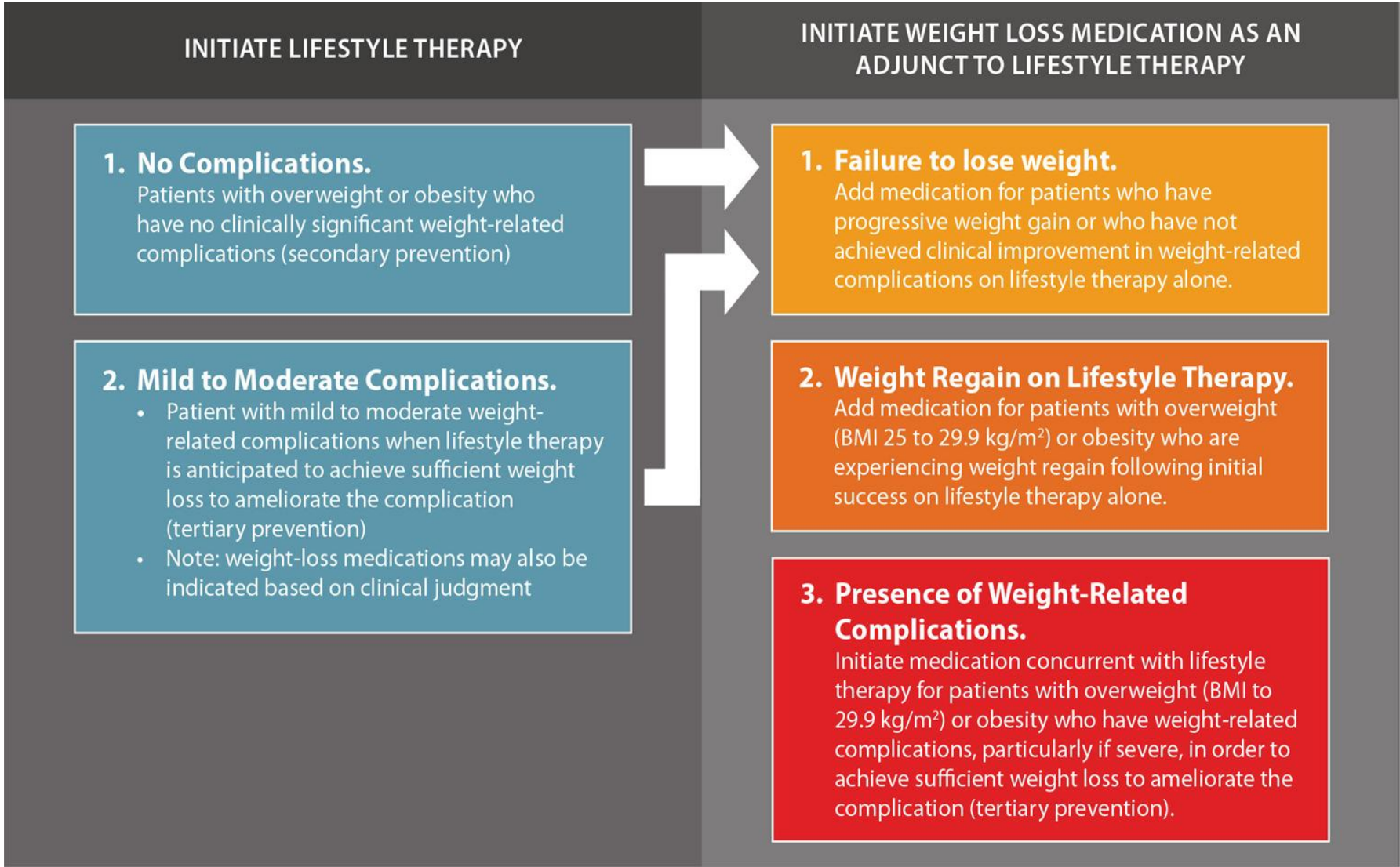


Visceral Fat

- Root cause of Lifestyle Induced Chronic Disease
  - Insulin Resistance
  - Diabetes
- Filling up of fat cells puts the body in a pro-inflammatory state
  - Effects all body organs



Obesity Guidelines



Expected Outcomes

- 3% weight loss
  - Decreased
    - Glucose
    - Triglycerides
    - Prevention of type 2 diabetes
- 5%
  - Decreased blood pressure
  - Improved cholesterol #’s
  - Improvements in Fatty Liver disease (MASLD)
- 10%
  - Decreased need for medications
  - Improvements in sleep apnea

Obesity Strategies

- Pharmacotherapy
  - Newest and most effective
    - GLP-1 (Listed in order of FDA approval)
      - Liraglutide (Saxenda)
      - Semaglutide (Wegovy)
      - Tirzepatide (Zepbound)
  - Phentermine (Adipex, Lomaira)
  - Phentermine/Topiramate (Qsymia)
  - Naltrexone/Buproprion HCL (Contrave)
  - Orlistat (Xenical) & [Alli – OTC]

Obesity Strategies

- **Insight**
  - **Identify the:**
    - **Causes (Meds, Illness, Stress etc.)**
    - **Triggers**
      - **Cultural**
        - **“Clean your plate” &“There are starving children in _____”**
        - **Not eating everything served may be disrespectful**
          - **India: Respect the food**
          - **Japan: Considered as wasting food**
          - **Various native cultures**
      - **Stress/Anxiety**
      - Boredom (Grazing)

Obesity Strategies

- Lifestyle Modification
  - Dietary changes
    - Proper nutritional balance is paramount
    - Review current food diary
    - Highlight excesses (non-judgmental)
    - Consider cultural issues
    - Build the eating plan with employee consensus
  - Exercise/Activity
    - Identify an available time slot
    - Start small
    - Consider employee finances
      - Walk (basically free) vs swim laps (gym membership)

Overview of GLP-1 Physiology and Incretin Function

GLP-1 Physiologic Functions

- GLP-1 promotes glucose homeostasis by stimulating insulin secretion, inhibiting glucagon, and slowing gastric emptying.

Short Half-Life and Enzyme Degradation

- Native GLP-1 is rapidly degraded by DPP-4 enzyme, resulting in a very short half-life under two minutes.

GLP-1 Receptor Agonists

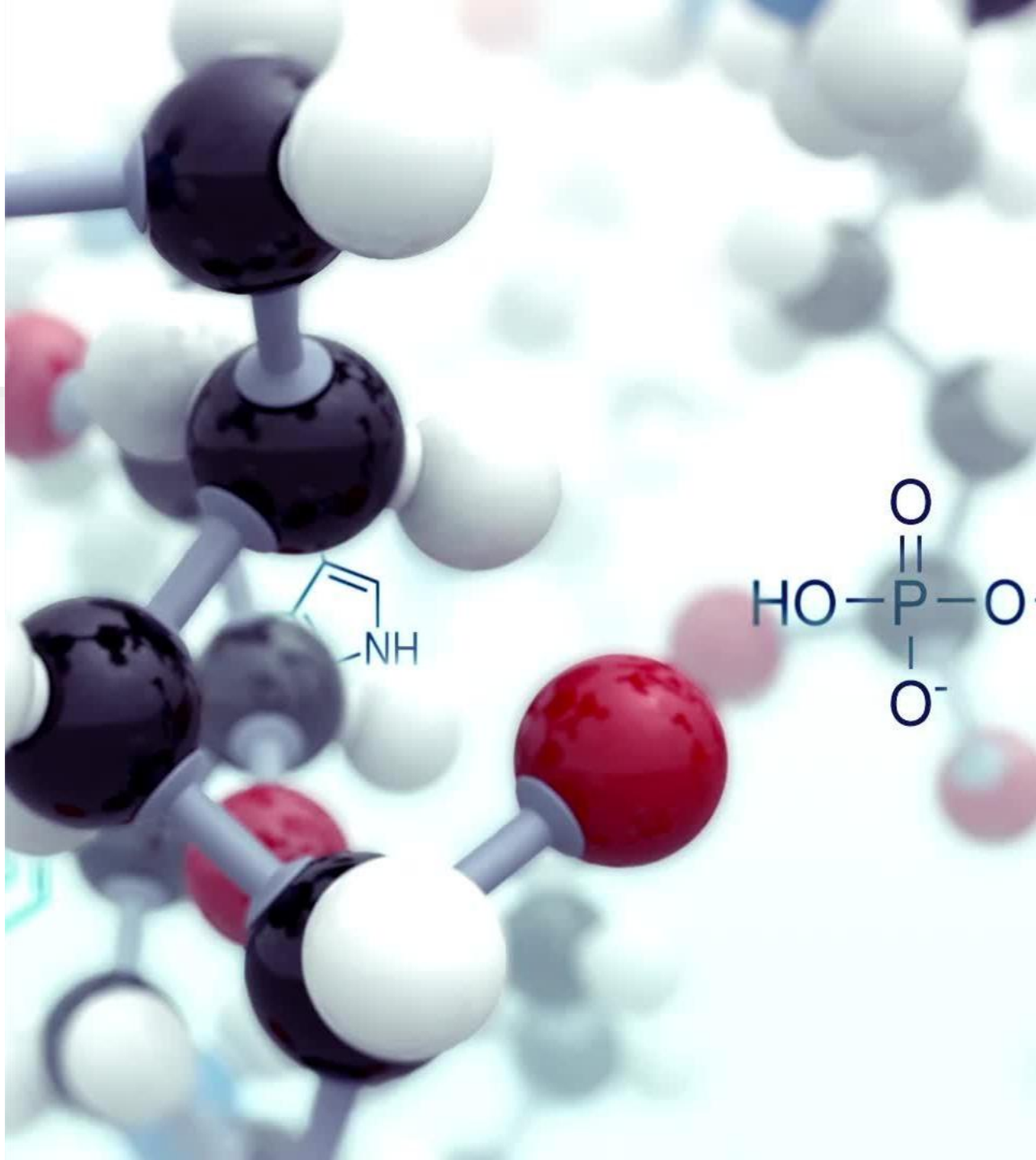
- Synthetic GLP-1 RAs resist degradation, offering prolonged activity and enhanced potency for therapeutic use.

Clinical Implications for Nursing

- Nurses use GLP-1 knowledge for patient education, monitoring responses, and managing side effects like satiety and gastric slowing.

What is a Peptide??

- Strings of amino acids
- Hormone-like substance



Incretin Physiology

- Incretins are hormones released from the intestine after meals
- Primary incretins: GLP-1 and GIP
- Enhance insulin secretion
- Reduce post-meal glucose levels

GLP-1 Physiologic Effects

- Stimulates glucose-dependent insulin secretion
- Suppresses glucagon release
- Slows gastric emptying
- Promotes satiety

Why GLP Medications Matter

- Obesity prevalence exceeds 40% in the United States
- Type 2 diabetes affects over 37 million Americans
- Weight reduction improves cardiometabolic risk
- GLP medications target both glucose and weight

What is GLP-1

- Glucagon–like peptide = GLP-1
  - Produced in the intestine after eating
    - Signals the brain to reduce the desire for food

What makes GLP's so special

- GLP's bind to dopamine receptors in the brain
  - Makes us feel good
- Slows GI Motility
  - Makes us feel full faster

Mechanism of Action of GLP-1 Receptor Agonists

Pancreatic Effects

- GLP-1 receptor agonists stimulate glucose-dependent insulin secretion and suppress glucagon to reduce blood glucose safely.

Gastrointestinal Benefits

- They slow gastric emptying, improving post-meal glucose control and promoting early satiety for weight loss.

Central Nervous System Action

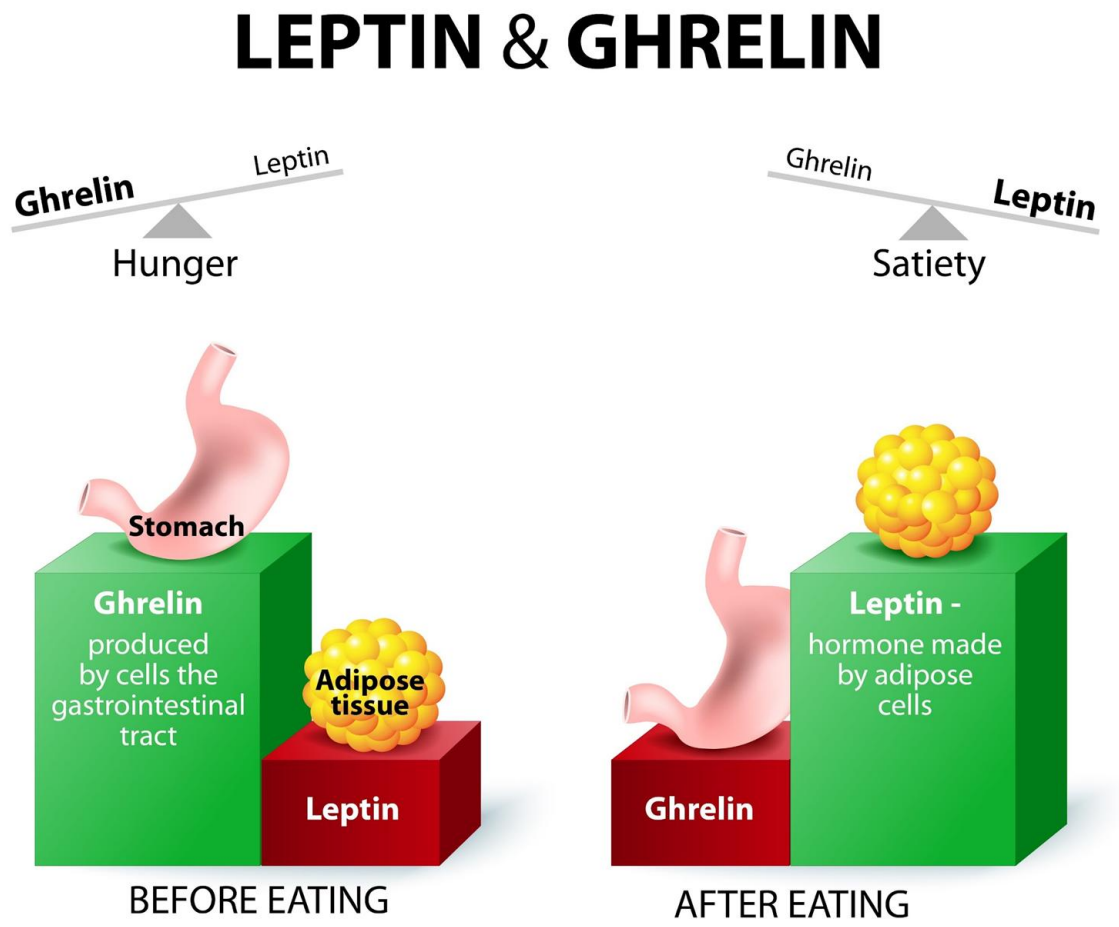
- GLP-1 agonists reduce appetite by acting on hypothalamic satiety centers, lowering caloric intake.

Cardiovascular and Renal Benefits

- These agents reduce inflammation, improve endothelial function, and lower risks of cardiac and kidney complications.

Appetite Hormones & Balance

- Ghrelin
  - Hunger hormone
  - Location: Stomach
- Leptin
  - Cause Satiety
  - Location : Adipose
- GLP1
  - Cause Satiety
  - Location: Intestine



Eat to Balance Your Hunger Hormones | Jillian Michaels

Medication	Brand Names	Dosing Frequency	Key Indications
Liraglutide	Victoza, Saxenda	Daily	T2DM, weight management
Dulaglutide	Trulicity	Weekly	T2DM, CV risk reduction
Semaglutide	Ozempic, Rybelsus, Wegovy	Weekly or daily oral	T2DM, obesity, CV risk
Tirzepatide	Mounjaro, Zepbound	Weekly	T2DM, obesity, CV risk, Sleep apnea

Common GLP-1 Medications and Formulations

Evidence and Indications

Semaglutide and tirzepatide are investigational or being investigated for (a) new use(s). Safety and efficacy are not established for all uses under investigation. There is no guarantee that these compounds will become commercially available for the use(s) under investigation. Direct comparisons between clinical trials should not be made.

Novo Nordisk®

Summary of evidence: semaglutide and tirzepatide

	Semaglutide 2.4 mg	Tirzepatide 5, 7.5, 10, 12.5, 15 mg
Weight management (adult)[1-8]	✓	✓
Weight management (pediatric)[9,10]	✓	TBD – ongoing
MACE[11-14]	✓	TBD – ongoing
HF[15-18]	✓	✓
Knee OA[19,20]	✓	TBD – ongoing
MASH[21,22]	✓	✓ Phase 2
OSA[23]	N/A	✓
Cost savings[24]	✓	N/A

	Semaglutide 1.0 mg*	Tirzepatide 5, 7.5, 10, 12.5, 15 mg
MCI due to AD[25,26]	TBD – ongoing (oral semaglutide 3, 7, 14 mg)	N/A
Glycemic control in T2D[27–31]	✓	✓
MACE in T2D[32,33]	✓	TBD – ongoing
PAD in T2D[34]	✓	N/A
CKD in T2D[35,36]	✓	TBD – ongoing

*All studies investigated s.c. semaglutide 1.0 mg except MCI due to AD study which investigated oral semaglutide. AD, Alzheimer's Disease; CKD, chronic kidney disease; HF, heart failure; MACE, major adverse cardiac events; MCI, mild cognitive impairment; MASH, metabolic dysfunction-associated steatohepatitis; OA, osteoarthritis; OSA, obstructive sleep apnea; PAD, peripheral artery disease; s.c., subcutaneous; T2D, types 2 diabetes; TBD, to be determined.

1. Wilding JPH et al. N Engl J Med 2021;384:989-1002; 2. Rubino D et al. JAMA 2021;325:1414-25; 3. Garvey WT et al. Nat Med 2022;28:2083-91; 4. Ruseva et al. Obes Sci Pract 2024;10(1):e737; 5. Jastreboff et al. N Engl J Med 2022;387:205-16; 6. Rodriguez PJ et al. JAMA Intern Med 2024; 184:1056-64; 7. Aronne LJ et al. JAMA 2024;331(1):38-48; 8. Hankosky ER et al. Diabetes Obes Metab 2025;27:2810-2821; 9. Weghuber D et al. N Engl J Med 2022;387:2245-57; 10. SURMOUNT-ADOLESCENTS. Clinicaltrials.gov. https://clinicaltrials.gov/study/NCT06075667. Accessed April 2025; 11. Lincoff AM et al. N Engl J Med 2023;389:2221-32; 12. Zhao Z et al. Presented at the ACC Scientific Session 2025, March 29 – 31, 2025, Chicago, IL; 13. Hankosky ER et al. Diabetes Obes Metab 2024;26:319-328; 14. SURMOUNT-MMO. Clinicaltrials.gov. https://clinicaltrials.gov/study/NCT05556512 Accessed May 2025; 15. Deanfield J et al. Lancet. 2024; 404: 773-86; 16. Kosiborod MN et al. N Engl J Med 2023; 389:1069-84; 17. Packer M et al. N Engl J Med 2025;392:427-37; 18. Augusto SN et al. Current Problems in Cardio 2025;50(4):102998; 19. Bliddal H et al. N Engl J Med 2024;391:1573-83; 20. STOP KNEE-OA. Clinicaltrials.gov. https://clinicaltrials.gov/study/NCT06191848. Accessed May 2025; 21. Sanyal AJ et al. N Engl J Med. 2025. doi:10.1056/NEJMoa2413258; 22. Loomba R et al. N Engl J Med 2024;391:229-310; 23. Malhotra A et al. N Engl J Med 2024;391:1193-205; 24. Novo Nordisk. Data on File; 25. evoke.

GLP-1 Effectiveness

- Semaglutide
  - 11.80%
    - Efficacy and safety of semaglutide 2.4 mg for weight loss in overweight or obese adults without diabetes: An updated systematic review and meta-analysis including the 2-year STEP 5 trial - Qin - 2024 - Diabetes, Obesity and Metabolism - Wiley Online Library
- Tirzepatide
  - 20.8%
    - Tirzepatide adds significant weight loss even after lifestyle changes | Cleveland Clinic Journal of Medicine (ccjm.org)

Dual Incretin Therapy

-Tirzepatide activates GLP-1 and GIP receptors

- Produces enhanced metabolic effects

- Associated with greater weight loss in trials

GLP Medication Dosing

Medication	Starting Dose	Titration	Maintenance
Wegovy	0.25 mg weekly	Increase every 4 weeks	2.4 mg weekly
Ozempic	0.25 mg weekly	0.5 → 1 mg	1–2 mg weekly
Mounjaro	2.5 mg weekly	Increase every 4 weeks	5–15 mg weekly
Zepbound	2.5 mg weekly	Increase every 4 weeks	5–15 mg weekly

FDA-Approved and Emerging Indications

Effects on the Root Cause of Lifestyle Induced Diseases

- Insulin Resistance
- Diabetes
- Cardiovascular disease
- Neuro-inflammation in the brain

Clinical Uses

Type 2 diabetes

Chronic weight management

Cardiovascular risk reduction in select patients

Common Side Effects

Nausea

Vomiting

Constipation

Diarrhea

Reduced appetite

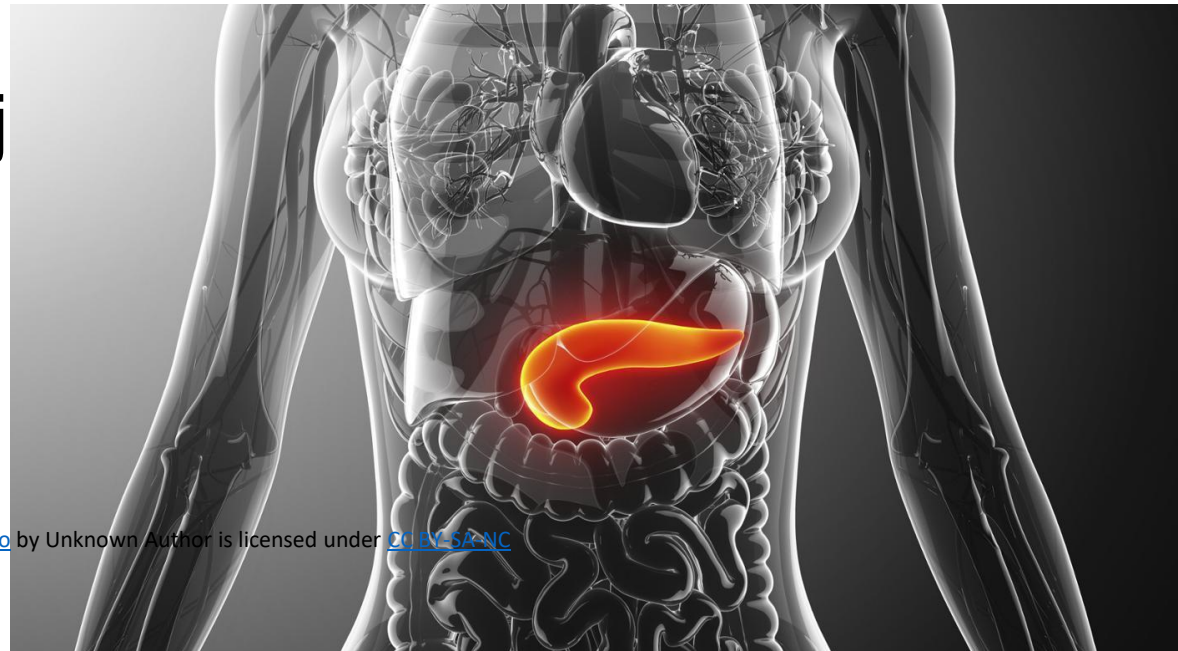
Managing Side Effects

- Eat smaller meals
- Avoid fatty foods
- Increase hydration
- Slow dose titration if neede

Serious Risks

- Pancreatitis
- Gallbladder Disease
- Medullary Thyroid Cancer
  - (possible)

https://jamanetwork.com/journals/jamaoncology/article-abstract/2830575



Perioperative Considerations

- GLP medications delay gastric emptying
- Potential aspiration risk during anesthesia
- Some guidelines recommend holding weekly GLP drugs before surgery
- Follow institutional protocols

Nursing Considerations

- Assess baseline weight and A1C
- Educate injection technique
- Monitor GI tolerance
- Encourage hydration and small meals

Emerging Therapies

- Retatrutide – triple incretin agonist
- CagriSema – semaglutide + amylin analogue

Potential weight loss approaching bariatric surgery outcomes

Adverse Effects, Contraindications, and Risk Management

Common Adverse Effects

- Gastrointestinal symptoms like nausea, vomiting, diarrhea, and constipation are frequent during dose escalation but manageable.

Serious Complications

- Rare but serious issues include pancreatitis, gallbladder disease, and kidney injury from dehydration requiring careful assessment.

Contraindications

- Contraindications include history of medullary thyroid carcinoma, MEN2, and severe gastroparesis due to risks and intolerance.

Risk Management Strategies

- Monitoring labs and educating patients about warning signs ensures safe use and prevents complications or treatment discontinuation.

Nursing Monitoring Responsibilities

Baseline Patient Assessments

- Nurses perform baseline assessments including weight, A1C, renal function, lipids, and gastrointestinal history to ensure safe therapy initiation.

Monitoring Therapy Progress

- Ongoing monitoring includes dose tolerance, hydration, gastrointestinal symptoms, weight, and blood glucose to evaluate treatment efficacy and safety.

Injection Technique and Oral Guidance

- Nurses assess injection technique for injectables and educate patients on fasting requirements for oral semaglutide to ensure proper administration.

Interdisciplinary Collaboration

- Nurses coordinate with prescribers and other professionals to support lifestyle changes, address barriers, and optimize patient therapy outcomes.

Patient Education Strategies

Medication Mechanism Education

- Explain GLP-1 therapy effects on insulin, appetite, and digestion to improve patient understanding and adherence.

Administration Instructions

- Demonstrate injectable pen use, needle safety, injection sites, and oral medication fasting requirements.

Managing Side Effects

- Prepare patients for gastrointestinal symptoms and advise on smaller meals, hydration, and diet adjustments.

Ongoing Support and Communication

- Use patient-centered communication, motivational interviewing, and follow-up to boost engagement and success.

Economic Considerations and Access Barriers

Cost and Insurance Challenges

- GLP-1 therapies have high annual costs and inconsistent insurance coverage, causing access barriers for many patients.

Nurses' Role in Access Support

- Nurses assist patients by navigating insurance restrictions, gathering appeal documentation, and finding assistance programs.

Long-Term Economic Benefits

- GLP-1 therapies improve health outcomes, potentially reducing long-term healthcare costs by lowering chronic disease burden.

Cost-Effectiveness Understanding

- Understanding cost-effectiveness metrics like ICER helps nurses contribute to therapy justification discussions.

Summary and Clinical Implications for Nursing Practice

Nursing Role in Patient Care

- Nurses assess suitability, educate on administration, and monitor side effects for safe GLP-1 therapy initiation and ongoing care.

Expanding Therapeutic Indications

- GLP-1 therapies are increasingly used beyond diabetes, including MASH, sleep apnea, and neurocognitive disorders requiring nursing awareness.

Addressing Access Disparities

- Nurses help patients navigate insurance and access financial resources to overcome barriers to GLP-1 therapy.

Interdisciplinary Collaboration

- Collaboration among healthcare providers ensures individualized, patient-centered GLP-1 treatment strategies for improved outcomes.

Indications under study

- Inflammatory conditions (RA, Chron's)
- Substance Abuse
- Neurodegenerative/Neuro-inflammatory disorders
- Alzheimer's
- PCOS
- Chronic Kidney Disease
- MASH
- Type 1 Diabetes (add on therapy)

Multi-prong Strategy >> SUCCESS

Lifestyle Modification

Pharmacotherapy

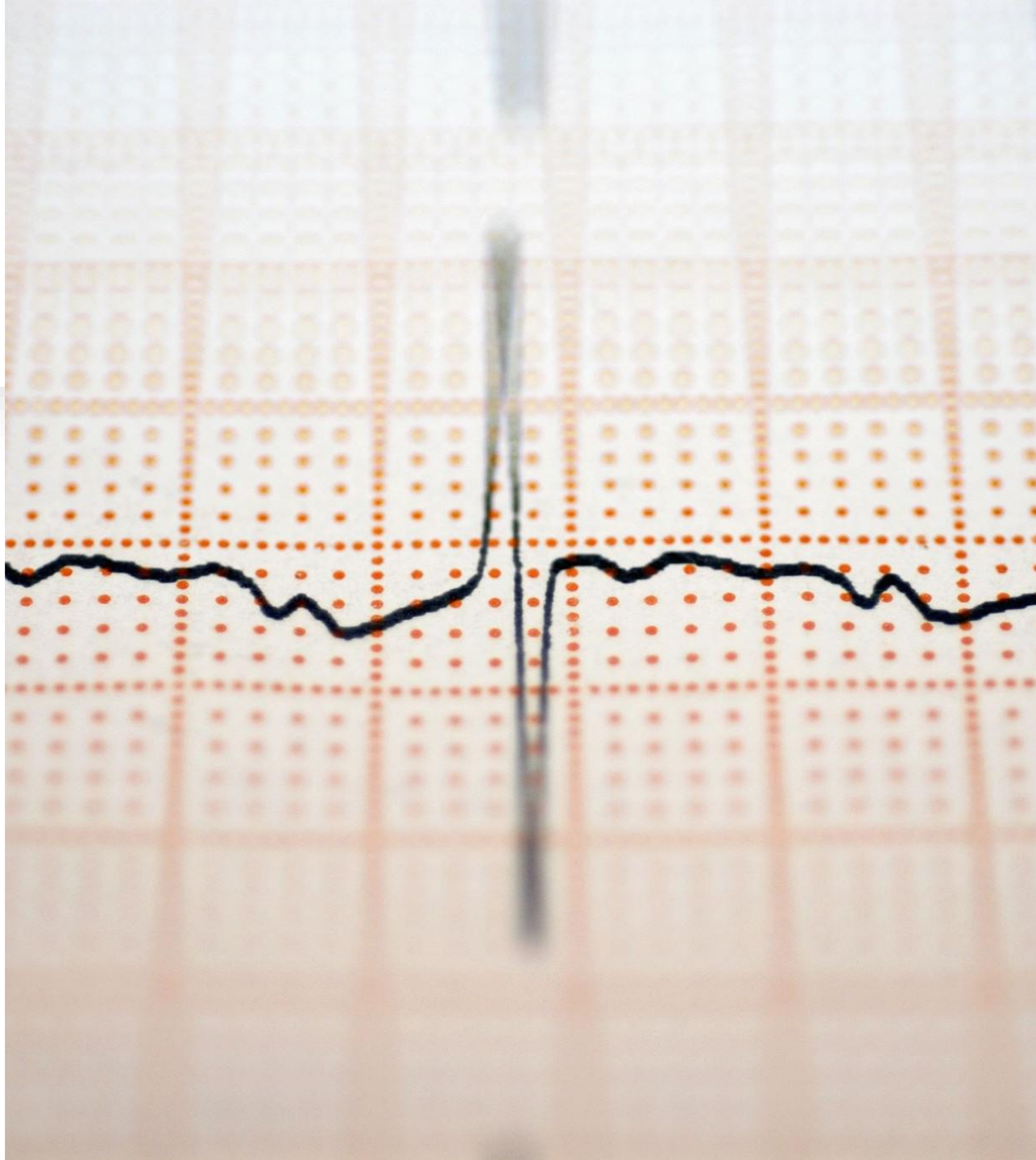
Insight

Comprehensive Strategies Work

- Medication
- Mental Health
- Lifestyle Modification
- Nutrition

Effect on the “Bottom Line”

- Stroke risk minimized
- Cardiac risk minimized
- Esophageal cancer risk minimized
- PMH : Cardiac Ablation x 3 @ $200,000 each
  - A fib ONLY under control with weight loss
- Sleep apnea resolved



Key Takeaways

- GLP-1 medications improve glycemic control
- Produce significant weight loss
- Require careful titration
- Nursing education improves adherence

Discussion Question

- What GLP medications do you see most often in practice?
- What side effects are most common in your patients?
- How can nurses improve patient adherence?

Occ Med = Access

- Decreases barriers to care
- Improves education
- Monitor progress more closely
- Quantify the value of diminishing obesity and metabolic disease costs.
- Manage minor symptoms well before they become “newsworthy”

Final Commentary

- Remember to take care of yourself **FIRST**
  - You can’t be on top of your game otherwise

Thank you

Contact Information

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