Heart and Sole of Diabetes

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Heart and Sole of Diabetes

Dietary Considerations
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Questions from patients regarding nutrition

- Does it really matter what I eat?
- What should I eat?
- Can I still eat _____?
- Can you give me a diet plan?
- Do I have to go on a no-carb diet?
- How can I make the keto diet work with my diabetes?
- How am I supposed to know what to eat?
- Well regular and diet soda are both bad for me, so I may as well drink regular right?

Goals of patient questions regarding nutrition

- Control blood sugars
- Eliminate confusion
- Maintain their lifestyle
- Balance life and health
- Validate their knowledge and resources
- Express frustration
When answering questions:

- Our goals as providers:
  - Promote variety of nutrient dense foods in appropriate portion sizes
  - Achieve body weight, glycemic, blood pressure and lipid goals
  - Delay/prevent complications
  - Maintain the pleasure of eating
  - Teach the individual to fish!
  - What are the practical tools that individual needs?

Where to start?

- For those not taking insulin:
  - Emphasize portion control and healthy food choices
- Portion control for weight loss
- For those taking insulin:
  - Appropriate energy intake
  - Carbohydrate counting (stick with total carbs)
- One simple change:
  - Decrease sugar sweetened beverage intake
Which eating pattern works?

- Mediterranean
- DASH
- "ADA Diet"
- Consistent Carbohydrate Plate Method
- High protein / low carb
- Carb / Insulin ratio
- Carbohydrate Counting
- Carb Choices
- Choose the eating pattern that gives the best blood sugar control

How to briefly assess knowledge:

- How do you decide what you are going to eat?
- What foods do you eat that raise your blood sugar the most?
- How many carbs do you have at a meal?
  - \(45-60\text{g/meal, 15-30/snack}\)
- How many carb choices are in a sandwich?
- **What resources would make you as successful with that method as you can be?**
How to choose resources?

- Example Plate Method:

academy_of_nutrition_and_dietetics.eatright.org

International Diabetes Center

Choose the right message: Medications

- Metformin
  - Take with foods or 15 minutes after a meal

- Secretagogues
  - Moderate carbohydrate with 3 meals/day and snacks
  - Carry carbohydrates with activity

- Insulin-requiring
  - Meal-time insulin:
    - Carb counting balance intake with amount of insulin given
When to get a dietitian involved?

- All individuals with diabetes should be offered a referral for individualized MNT (A)
  - Associated with A1c Improvement:
    - Type 1: 1.0-1.9%
    - Type 2: 0.3-2.0%
- When the patient is willing (or willing with encouragement)
- When more personalization is needed
- When 30-60 minutes is likely to get a better result?

DSME and DSMS Algorithm of Care

Diabetes Self-management Education and Support for Adults With Type 2 Diabetes: Algorithm of Care

ADA Standards of Medical Care in Diabetes recommends all patients be assessed and referred for:

<table>
<thead>
<tr>
<th>Nutrition</th>
<th>Education</th>
<th>Emotional Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered dietitian for medical nutrition therapy</td>
<td>Diabetes self-management education and support</td>
<td>Mental health professional, if needed</td>
</tr>
</tbody>
</table>

Four critical times to assess, provide, and adjust diabetes self-management education and support

1. At diagnosis
2. Annual assessment of education, nutrition, and emotional needs
3. When new complicating factors influence self-management
4. When transitions in care occur

When primary care provider or specialist should consider referral:

- Newly diagnosed
- All newly diagnosed individuals with type 2 diabetes should receive DSME/S
- Ensure that both nutrition and emotional health are appropriately addressed in education or make separate referrals
- Needs review of knowledge, skills, and behaviors
- Long-standing diabetes with limited prior education
- Change in medication, activity, or medication model
- HbA1c out of target
- Cardiac or other chronic health issues or complications
- Uncontrolled hypertension or hypotension
- Planning pregnancy or pregnant
- For support in attaining and sustaining behavior change
- Weight or other nutrition concerns
- New life situations and competing demands

Change in:
- Medical conditions such as renal disease and stroke, need for revised or complicated medication regimen
- Physical limitations such as visual impairment, dexterity issues, movement restrictions
- Emotional factors such as anxiety and clinical depression
- Socioeconomic needs such as access to food, financial limitations

Change in:
- Living situation such as impatient or outpatient rehabilitation or new living situation
- Medical care team
- Insurance coverage that results in treatment change
- Age-related changes affecting cognition, self-care, etc.

Margaret A. Powers et al. Dia Care 2015;38:1372-1382

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Exercise & You: The \( \text{❤️} \) & Sole of the Matter

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Sauk Prairie Healthcare
Objectives

- Review the benefits of small scale exercise interventions
- Discuss motivation techniques to encourage patient to make changes


Physical Activity (PA) / Exercise

- PA all movement that increase energy use
- Exercise is planned, structured physical activity
- Whether Type 2, Type 1, Gestational, or prediabetes
- **AEROBIC Exercise** repeated and continuous movement large muscle
  - Walking
  - Cycling
  - Jogging
  - Swimming
- **RESISTANCE** Exercise weights, body weight, or elastic bands
- **FLEXIBILITY** Exercise improve range of motion
- **BALANCE** Exercise benefit gait and prevent falls
BENEFITS OF EXERCISE AND PHYSICAL ACTIVITY

- Aerobic: insulin sensitivity, lung function, immune function, cardiac output
- Resistance: Improvements in muscle mass, body composition, strength, physical function, mental health, bone mineral density, insulin sensitivity, B/P, lipid, cardiovascular health
- The effect of resistance exercise on glycemic control in type 1 diabetes is unclear. However, resistance exercise can assist in minimizing risk of exercise-induced hypoglycemia in type 1 diabetes. When resistance and aerobic exercise are undertaken in one exercise session, performing resistance first results in less hypoglycemia than when aerobic exercise is performed first.
- Type 2 benefit from resistance training with BG control, insulin resistance. Fat mass, B/P, strength, and lean body mass.

Pre – Exercise Health Screening and Evaluation

- American College of Sports Medicine (ASCM): Anyone DM sedentary at any intensity should obtain prior medical clearance from HCP.
- Position statement of ADA believes this to be excessively conservative.
- Thus, Pre-exercise medical clearance is not necessary for asymptomatic individuals receiving diabetes care consistent with guidelines low- or moderate – intensity PA not exceeding brisk walking or everyday living.
- Risks of acute complications include: hypoglycemia, cardiac events, and hyperglycemia
Small Scale Intervention
Unstructured Physical Activity

- I work all day
- I watch my grand kids
- I take my dog on a walk every day
- I work my own garden
- All these increase daily energy expenditures. Increasing this even in brief (3-15 min) bouts, is effective in acutely reducing Post Prandial hyperglycemia in improving glycemic control in those with Pre-DM and type 1 and 2. Increasing unstructured PA should be encouraged as part of a whole-day approach, or at least initially as a stepping stone for more structured exercise.

HYPOGLYCEMIA

- Most common in Type 1
- Insulin and insulin secretagogues
- Increase carbs
- Reduce insulin depot
- Maximal intensity sprint before and or after a moderate-intensity exercise session may protect against hypoglycemia
Hypoglycemia continued:

- Performing high-intensity bouts intermittently during moderate aerobic exercise also slows blood glucose declines, as can resistance exercise done immediately prior to aerobic
- 6-15 hours post exercise
- Can extend 48 hours
- 20% reduction in basal insulin can mitigate risk

Anaerobic exercise

- History: 5k runner
  - Temp Target 1 hour before / during run
- New to weight lifting
  - Tried running strategy for resistance workout
  - Resulted in high
- New strategy:
  - Set Temp Target 30 minutes prior to workout
  - Stop Temp Target mid-workout
- Result: Stable glucose throughout/after activity
Mental Encouragement

- The Patient says, “I just don’t have enough time to exercise.”
- 1,440 Minutes in a day
- First 10 minutes - Stored muscle glycogen
- Next 30 minutes - Available glucose in bloodstream (looking for a place to land < 3 options: Muscle, Liver, Triglycerides)
- After 40 minutes looks for alternate fuel source. (Fat)
- Increases metabolism for 12 to 24 hours
- 30 to 40 minutes of exercise can result in up to 720 to 1,440 minutes of glucose lowering.
- ☺☺☺ +☺☺☺ +☺☺☺ +☺☺☺ +☺☺☺ +☺☺☺ +☺☺☺ +☺☺ +☺

Considerations

- Cardiovascular diseases
  - CAD
  - Exertional angina
  - Hypertension
  - MI
  - Stroke
  - CHF
  - PAD
- Nerve diseases
  - Peripheral neuropathy
  - Local foot deformity
  - Foot ulcers/amputations
  - Autonomic neuropathy
- Eye diseases
  - Mild to moderate non-proliferative retinopathy
  - Severe non-proliferative and unstable proliferative retinopathy
  - Cataracts
- Kidney diseases
  - Microalbuminuria
  - Overt nephropathy
  - End-stage renal disease
- Orthopedic limitations
  - Structural changes to joints
  - Arthritis
BEHAVIOR – CHANGE STRATEGIES
5 Key Techniques

#1) Prompt focus on past success
#2) Barrier identification/problem solving
#3) Use of follow-up prompts
#4) Provision of information on where/when to perform the behavior
#5) Prompt review of behavioral goals

Behavioral interventions can significantly increase physical activity in adults with type 2 diabetes, and A1c reductions produced by such interventions have been sustained to 24 months.

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Vulnerable Adult Patients with Diabetes

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MercyHealth, Janesville, WI
Family Medicine Residency Program

Role of Certified Social Worker

Family Medicine Residency Program
Strategies:

- Native Language/Communication
  - Certified Interpreter
  - Language Line
  - Education Materials

- Basic Needs
  - Shelter
  - Food
  - Clothing
  - Transportation

Strategies:

- Trauma Informed Care Provider
  - Empower vs Enable: Emphasizing Resilience
  - Coping strategies: Connectedness, Mindfulness, Rapport
Strategies:

- **Accommodating patient needs:**
  - Free glucose meters
  - Diabetes care kits, samples
  - Clean socks
  - Use of technology
  - Arranging medication lock boxes, sharps containers, pill boxes
  - Service and therapy animals
  - Support groups

- **Insurance and Financial**
  - Medicaid, Medicare -- SeniorCare, ExtraHelp
  - PFC
  - Patient Assistance Programs
  - Walmart $4 co-pay
  - JCHC, BCHC, BSP (Benevolent Specialist Project), HealthNet
  - Drug coupon cards
  - Creative billing: DME
Community Resources:

- APS referral/Vulnerable Adult
- ADRC, local pharmacies
- slush fund
- donation closet
- AIM (Advanced Illness Management)
- GAC (Geriatric Assessment Clinic)
- MOW
- MTM Transportation
- Council on Aging
- Behavioral Health

Quality Patient Care

- Advance Directives
- Assessing competency issues/guardianship
- Emergency contacts, current phone numbers

ROI
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2019 Professional Diabetes Education Conference

March 15-16
Marriott Madison West, Middleton WI
Heart and Sole of Diabetes Care

The Diabetic Foot Exam

Dr. Gregory Zainer

Department of Podiatry/Orthopedics
Mercy Health

The Components of the Diabetic Foot Exam

- Vascular
- Shoes
- Orthopedic
- Neurological
- Dermatological
Vascular Exam of the Foot

1. Dorsalis Pedis Pulse
2. Posterior Tibial Pulse
3. Capillary Refill Test
Orthopedic Examination of the Foot

Foot Deformity
1. Hallux Valgus (Bunion)
2. Hammertoes, Mallet Toes, and Claw toes
3. Tailor Bunions

Hallux Valgus
Hammertoes

Contracture at Proximal Phalangeal Joint

Mallet Toes

Contracture at Distal inter-phalangeal joint
Tailor Bunions

Dermatology Exam

1. Nails
2. Skin
3. Hair Growth patterns
Nail Pathology

1. Onychomycosis
   a. Nail fungal infection
2. Onychogryphosis
   a. Rams Horn
3. Melanoma

Dermatology

Skin Problems

1. Xerosis Cutis
   a. Dry skin
2. Tinea Pedis
   a. Athletes Foot
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Considering Cardiovascular Risk in T2DM

Timothy S. Reid, M.D.
Mercy Diabetes Center
Janesville, WI

Diabetes and CV Risk

- Adults with diabetes are **2-4 times more likely to die from heart disease** than adults without diabetes¹
- 68% of people >65 years of age die from some form of heart disease, 16% die from stroke¹

Why are people with Diabetes at increased CV Risk?¹
  - Hypertension
  - Lipids
  - Obesity
  - Sedentary Lifestyle
  - Poorly controlled blood sugars
  - Smoking

The Next Steps:

• Medication Choices in lowering blood glucose
  • 7 major classes of medication and a number of minor classes
  • All have known side effect profiles
    • GI
    • Weight gain/fluid retention
    • Hypoglycemia risk
    • GU/Bladder/Yeast
    • Cost
  • Some have “side benefits” that we can leverage for our patients
    • Low hypoglycemia risk
    • Weight neutral or weight losing
    • Satiety
    • Now, CV, CHF and Renal Protection

The Next Steps:

• Medication Choices in lowering blood glucose
  • We now have medications that can lower CV risk, CHF and Renal risk
  • 2 Classes of medication:
    • GLP-1 RA
      • Liraglutide
    • SGLT-2i
      • Canagliflozin
      • Empagliflozin
What is MACE?

**Major Adverse Cardiovascular Events:**
- CV Death
- Non-fatal MI
- Non-fatal Stroke

！GLP-1RAs and CV Outcome Trials

<table>
<thead>
<tr>
<th>Study</th>
<th>ELIXA(^1)</th>
<th>EXSCEL(^2)</th>
<th>LEADER(^3)</th>
<th>REWIND(^4)</th>
<th>SUSTAIN-6(^5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLP-IRA</td>
<td>Lixisenatide</td>
<td>Exenatide LR</td>
<td>Liraglutide</td>
<td>Dulaglutide</td>
<td>Semaglutide</td>
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<tr>
<td>N</td>
<td>6068</td>
<td>5400</td>
<td>9340</td>
<td>8300</td>
<td>2735</td>
</tr>
<tr>
<td>Duration</td>
<td>25 mo (median)</td>
<td>3.2 y</td>
<td>3.8 y</td>
<td>Up to 6.5 y</td>
<td>104 wks</td>
</tr>
<tr>
<td>Primary Endpoint</td>
<td>MACE + hosp for unstable angina</td>
<td>MACE</td>
<td>Time to event MACE</td>
<td>Time to event MACE</td>
<td>Time to event MACE</td>
</tr>
<tr>
<td>HR</td>
<td>1.02 CI 0.89-1.17</td>
<td>0.91 CI 0.83-1.00</td>
<td>0.87 CI 0.78-0.97</td>
<td>TBD</td>
<td>0.74 CI 0.58-0.95</td>
</tr>
<tr>
<td>Results</td>
<td>Non-inferior (P&lt;0.001)</td>
<td>Non-inferior (P&lt;0.001)</td>
<td>Non-inferior (P&lt;0.001) Superior (P&lt;0.01)</td>
<td>TBD</td>
<td>Non-inferior (P&lt;0.001)</td>
</tr>
</tbody>
</table>

# CV Trials

<table>
<thead>
<tr>
<th>Study</th>
<th>CANVAS(^1)</th>
<th>DECLARE-TIMI58(^2)</th>
<th>EMPA-REG(^3)</th>
<th>VERTIS CV(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGLT-2</td>
<td>Canagliflozin</td>
<td>Dapagliflozin</td>
<td>Empagliflozin</td>
<td>Ertugliflozin</td>
</tr>
<tr>
<td>N</td>
<td>10,142</td>
<td>17160</td>
<td>7020</td>
<td>8000</td>
</tr>
<tr>
<td>Duration</td>
<td>188.2 weeks</td>
<td>3.1 years</td>
<td>6.1 years</td>
<td></td>
</tr>
<tr>
<td>Resulted</td>
<td>2017</td>
<td>Nov 2018</td>
<td>2015</td>
<td>Late 2019 (anticipated)</td>
</tr>
<tr>
<td>Primary Endpoint</td>
<td>MACE</td>
<td>MACE</td>
<td>MACE</td>
<td>MACE</td>
</tr>
<tr>
<td>HR</td>
<td>0.86; CI 0.75-0.97</td>
<td>0.93; 95% CI, 0.84 to 1.03;</td>
<td>0.86; CI 0.74-0.99</td>
<td>TBD</td>
</tr>
<tr>
<td>Results</td>
<td>Non-inferior p&lt;0.001 Superior P=0.02</td>
<td>No Difference P=0.17 Reduced CV Death or Hosp for HF HR &lt; 0.83</td>
<td>Superiority P=0.04</td>
<td>TBD</td>
</tr>
</tbody>
</table>


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**Practical Considerations:**

- **Secondary CV Risk Prevention:**
  - Use either SGLT-2i or GLP-1RA with an eye toward the patient's co-morbidities and side effect profile
  - If CHF: strongly consider a SGLT-2i to reduce risk
  - If CKD: strongly consider the SGLT-2
    - **Follow renal function closely**
    - Empagliflozin not recommended for eGFR <45ml/min/1.73m²
    - Canagliflozin not recommended for eGFR <45ml/min/1.73m² and contraindicated for eGFR of <30ml/min/1.73m²
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