OPTUMHealth™ Education

Coming Soon!

March, Approach to Managing the Complex Patient

April, Chronic Low Back Pain: Appropriate Non-surgical vs Surgical Management

May, Weight Reduction Strategies: When to Use Medical vs Bariatric Treatments

June, Evaluation and Management of Sleep Apnea

Diabetes: Management and Prevention of Complications

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Introducing Your Faculty

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Objectives

At the end of this activity, participants should be able to:

• Identify current practices, recent pharmacologic treatments and advances in the management of diabetes based on evidence based medicine;

• State best practices for diabetes through the use of case study examples;

• Discuss the importance of screening and assessing mental and physical health in diabetes; and

• Identify ethical concerns in research and medical practices for diabetes.

Agenda

- Types of Diabetes (DM) and Etiology
- Risk Factors
- Screenings
- Diagnosing
- Medical Care
- Medical Evaluations
- Mental Health Factors
- Lifestyle Managements
- Preventions
- Treatments
- Complications
- Ethics
- Worsening Symptoms
- 4 Pillars
- Case Study

Types of Diabetes and Etiology

- **Type 1 Diabetes**
  - Pancreatic B-cell destruction

- **Type 2 Diabetes**
  - Progressive loss of B-cell function, typically associated with insulin resistance

- **Gestational Diabetes**
  - Diabetes that develops in the second or third trimester of pregnancy

- **Other Types**
  - Monogenic diabetes, diseases of the pancreas, and drug induced

UTD: Classification of diabetes mellitus and genetic diabetic, syndromes www.uptodate.com/contents/classification-of-diabetes-mellitus-and-genetic-diabetic-syndromes?search=Types%20of%20Diabetes&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1

Type 1 Diabetes

- Previously called *"insulin dependent diabetes"* or *"juvenile-onset diabetes"*
- Develops when the immune system destroys pancreatic beta cells and the rate of beta cell destruction is variable
- 5-10% of the U.S. population diagnosed with Diabetes have type 1 (CDC 2018)[1]

Risk Factors

- Multiple genetic predispositions
- Environmental factors[2]

> ***Patients with type 1 diabetes have a high risk of developing other autoimmune diseases[1]***

[1] CDC: Quick Facts, www.cdc.gov/diabetes/basics/quick-facts.html
[2] UTD: Classification of diabetes mellitus and genetic diabetic, syndromes www.uptodate.com/contents/classification-of-diabetes-mellitus-and-genetic-diabetic-syndromes?search=Types%20of%20Diabetes&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1

Type 2 Diabetes

- Previously called *"non-insulin dependent diabetes"* or *"adult onset diabetes"*
- 90-95% of the U.S. population diagnosed with diabetes have type 2 (CDC, 2018)
- Suffer from insulin deficiency and/or peripheral insulin resistance
- Most are overweight or obese
- **Usually goes undiagnosed for many years as hyperglycemia develops gradually**

CDC: Quick Facts, www.cdc.gov/diabetes/basics/quick-facts.html

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Gestational Diabetes

- Gestational diabetes for years had been defined as *"glucose intolerance"* that was first diagnosed during pregnancy
- Usually diagnosed in the second or third trimester of pregnancy
- 2% to 10% of pregnancies in the United States are affected by gestational diabetes (CDC 2017)
- Testing should occur at 24-28 weeks of gestation
- Those who have been diagnosed with gestational diabetes have an increased risk of developing diabetes in the future
- Testing for persistent diabetes should occur at 4-12 weeks postpartum
- Lifelong screening should continue and occur at least every 1 to 3 years

CDC: Gestational Diabetes, www.cdc.gov/diabetes/basics/gestational.html

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Prediabetes

- Prediabetes leads to an increased risk of developing diabetes and cardiovascular disease
- More than 1/3 American's have prediabetes (CDC 2018)[1]
- Impaired fasting glucose (IFG) and/or impaired glucose tolerance(IGT)
  - IFG: Fasting blood sugar level is elevated between 100 and 125 mg/dL
  - IGT: Blood sugar level is elevated between 140 and 199 mg/dL after a 2 hour oral glucose tolerance test
- A1c values between 5.7% and 6.4% can also identify those with prediabetes
- Patients should be counseled on their increased risk of developing diabetes and cardiovascular disease[2]

[1] CDC: Prediabetes, www.cdc.gov/diabetes/basics/prediabetes.html
[2] 2019 DM Guidelines: Prediabetes and Type 2, pp 25 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes – Major Risk Factors

- Overweight or obese (BMI ≥ 25 kg/m2 or ≥ 23 kg/m2 in Asian Americans)
- First degree relative with diabetes
- High risk race or ethnicity
- History of cardiovascular disease
- Hypertension
- Low high-density lipoprotein (HDL) and/or elevated triglycerides
- Polycystic ovarian syndrome
- Physical inactivity

2019 DM Guidelines: Table 2.3, pp 25 / 204 care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diagnosing of Diabetes – Type 1 and Type 2

- Diagnosis of type 1 diabetes
  - Usually occurs when individuals present with acute symptoms such as polyuria, polydipsia, and at times diabetic ketoacidosis, along with significantly elevated blood glucose levels

- Diagnosis of type 2 diabetes
  - The majority of patients are asymptomatic

- Hyperglycemia is noted on routine laboratory evaluation, such as
  - ❖ Fasting glucose of ≥ 126 mg/dL
  - ❖ 2 hour glucose tolerance test results ≥ 200 mg/dL
  - ❖ A1c ≥ 6.5%
  - ❖ Random glucose >200mg/dl

UTD: Clinical presentation and diagnosis of diabetes mellitus in adults, Clinical Presentation, www.uptodate.com/contents/clinical-presentation-and-diagnosis-of-diabetes-mellitus-in-adults?search=diagnosing%20diabetes&source=_search_result&selectedTitle=1~150&usage_type=default&display_rank=1

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Diagnosing of Diabetes

There are various risk assessment tools such as the ADA diabetes risk tool which can help guide providers on when to consider testing

ADA: Risk Assessment Tool, main.diabetes.org/dorg/PDFs/risk-test-paper-version.pdf

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Diagnosing of Diabetes

4. Do you have a mother, father, sister or brother with diabetes?
Yes (1 point)   No (0 points)

5. Have you ever been diagnosed with high blood pressure?
Yes (1 point)   No (0 points)

6. Are you physically active?
Yes (0 points)   No (1 point)

7. What is your weight category?
See chart at right.

If you scored 5 or higher:
You are at increased risk for having type 2 diabetes. However, only your doctor can tell for sure if you do have type 2 diabetes or prediabetes, a condition in which blood glucose levels are higher than normal but not yet high enough to be diagnosed as diabetes. Talk to your doctor to see if additional testing is needed.

Type 2 diabetes is more common in African Americans, Hispanics/Latinos, Native Americans, Asian Americans, and Native Hawaiians and Pacific Islanders.

Higher body weight increases diabetes risk for everyone. Asian Americans are at increased diabetes risk at lower body weight than the rest of the general public (about 15 pounds lower).

ADD UP YOUR SCORE

The good news is you can manage your risk for type 2 diabetes. Small steps make a big difference in helping you live a longer, healthier life.

For more information, visit us at **diabetes.org/alertday** or call **1-800-DIABETES (800-342-2383).**

Height	Weight (lbs.)		
4' 10"	119-142	143-190	191+
4' 11"	124-147	148-197	198+
5' 0"	128-152	153-203	204+
5' 1"	132-157	158-210	211+
5' 2"	136-163	164-217	218+
5' 3"	141-168	169-224	225+
5' 4"	145-173	174-231	232+
5' 5"	150-179	180-239	240+
5' 6"	155-185	186-246	247+
5' 7"	159-190	191-254	255+
5' 8"	164-196	197-261	262+
5' 9"	169-202	203-269	270+
5' 10"	174-208	209-277	278+
5' 11"	179-214	215-285	286+
6' 0"	184-220	221-293	294+
6' 1"	189-226	227-301	302+
6' 2"	194-232	233-310	311+
6' 3"	200-239	240-318	319+
6' 4"	205-245	246-327	328+
	1 point	2 points	3 points

If you weigh less than the amount in the left column: 0 points

ADA: Risk Assessment Tool, main.diabetes.org/dorg/PDFs/risk-test-paper-version.pdf

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Diagnosing of Diabetes – Prediabetes and Type 2

- A second test is typically required for confirmation
- **Testing should be considered for those who are overweight/obese and have one or more risk factor for developing diabetes**
- **All individuals over the age of 45 should have screening completed**
- For children and adolescents that are overweight or obese with additional risk factors, screening should be considered
- For adults ≥ 65 years/old screening for early detection of mild cognitive impairment or dementia and depression is indicated (impact in DM self-management; framework to determine targets and treatment approaches for DM)

2019 DM Guidelines: Prediabetes and Type II, Recommendations, pp 25 / 204 care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Medical Evaluation of Diabetes

A comprehensive medical evaluation should be completed at the initial visit and/or on telephonic calls. This can include:

- Classify type of diabetes
- Review previous medical history to include medications, hospitalizations, family history, common comorbidities, and immunizations (Immunizations annual flu vaccine, pneumococcal 23 valent between ages 2- 64; repeat at age ≥ 65 regardless of history; hepatitis B series)
- Lifestyle and behavior patterns

- Diabetes self-management education and support
- Hypoglycemia
- Woman and Childbearing, pregnancy planning
- Physical Exam: Height/weight, BMI, BP, skin exam, comprehensive foot exam
- Lab Evaluation: A1c, lipid profile, LFT's, spot urinary albumin to creatinine ratio, creatinine/estimated GFR

2019 DM Guidelines: Table 4.1, pp 45-46 / 204 care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Medical Evaluation of Diabetes

Follow-up visits and/or on telephonic calls should include most of the components of the initial comprehensive medical evaluation:

- Interval medical history
- Assessment of medications, adherence, review for intolerances/side effects
- Physical exam
- Nutrition
- Psychosocial health
- Other routine health maintenance screenings.
- Lab evaluations

2019 DM Guidelines: Table 4.1, pp 45-46 / 204 care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes and Mental Health

- Bidirectional Relationship

- Prevalence of Depression increased moderately in pre-diabetes patients and significantly in those with diabetes

- Up to 40% of patients with diabetes experience clinically significant anxiety

- Depression may increase risk of Type 2 DM by 60%

- Consequences
    - Worsens prognosis
    - Increased treatment non-adherence
    - Decreased quality of life
    - Increased mortality
- Mental Health issues are underdiagnosed and/or undertreated

Badescu SV, etal. The association between Diabetes mellitus and Depression. www.ncbi.nlm.nih.gov/pmc/articles/PMC4863499/, J Med Life. 2016 Apr-Jun; 9(2) : 120-125. and Moulton CD, etal. And The link between depression and diabetes: the search for shared mechanisms. www.ncbi.nlm.nih.gov/pubmed/25995124, Lancet Diabetes Endocrinology. 2015; 3: 461-471

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Pathophysiology

- **Life Style**
    - Increased stress
    - Decreased sleep
    - Decreased activity
    - Increased carbohydrate consumption

- Stress increases hypothalamic-pituitary adrenal (HPA) and sympathetic nervous system (SNS-fight or flight response) activities
    - Immune dysfunction
    - Increased cytokines interacts with pancreatic beta cells inducing insulin resistance
    - Increased baseline cortisol
    - Lack of insulin affects neurotransmitter metabolism

Badescu SV, etal. The association between Diabetes mellitus and Depression. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4863499/, J Med Life. 2016 Apr-Jun; 9(2) : 120-125. and Moulton CD, etal. , The link between depression and diabetes: the search for shared mechanisms. www.ncbi.nlm.nih.gov/pubmed/25995124, Lancet Diabetes Endocrinology. 2015; 3: 461-471

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Interventions

- **Screen for depression (PHQ-9, PHQ-4)**

- **Treat each condition simultaneously**
  - **SSRIs suggested first line treatment (confirmed favorable effects on glycemic control)**
  - **Be thoughtful of medication contribution to development of metabolic syndrome)**

- Psychosocial interventions (exercise, dietary, support)

Badescu SV, etal. The association between Diabetes mellitus and Depression. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4863499/, J Med Life. 2016 Apr-Jun; 9(2) : 120-125. and Moulton CD, etal., The link between depression and diabetes: the search for shared mechanisms, www.ncbi.nlm.nih.gov/pubmed/25995124, Lancet Diabetes Endocrinology. 2015; 3: 461-471

Diabetes Lifestyle Management

Lifestyle management is a very important part of diabetes care, and this includes:

- Diabetes self-management education and support (DSMES)

- Physical activity

- Medical nutrition therapy (MNT)

- Smoking cessation counseling

- Psychosocial care

2019 DM Guidelines: Section 5, Lifestyle Management, pp 54 to 64 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Lifestyle Management

Nutrition Therapy

- An individualized MNT program, preferably provided by a registered dietician

- Emphasis should be on consuming a variety of nutrient dense foods in appropriate portion sizes

- Weight loss > 5% for obese individuals with type 2 prediabetes/diabetes from the combination of reduced calorie intake and lifestyle modifications is beneficial

- For those with type 1 diabetes and type 2 diabetes on flexible insulin therapy, education on carbohydrate counting to determine mealtime insulin dosing is recommended to improve glycemic control

2019 DM Guidelines: Table 5.1, Lifestyle Management, pp 57 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

Diabetes Lifestyle Management

Physical Activity Recommendations

- Children and adolescents with prediabetes/diabetes should have 60 min/day or more of moderate to vigorous aerobic activity in addition to vigorous muscle/bone strengthening activities at least 3x per week

- Adults with type 1 and type 2 diabetes should have at least 150 min or more moderate to vigorous aerobic activity per week at least 3x per week with no more than 2 consecutive days without activity; 2-3 sessions of resistance training per week is also recommended

- Prolonged sitting for more than 30 minutes at a time should be avoided

- Flexibility and balance training is recommended 2-3x per week for older adults

2019 DM Guidelines: Physical Activity Recommendations, pp 59 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Lifestyle Management

Smoking Cessation

- **All patients should be advised against the use of cigarettes and other tobacco products or e-cigarettes**

- **Review smoking cessation counseling and support available through quit lines and pharmacologic therapy if appropriate**

- **Smoking cessation counseling should be a routine part of diabetes care**

2019 DM Guidelines: Smoking Cessation Recommendation pp 61 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Lifestyle Management

Psychosocial Issues, Can Include Review of:

- Attitudes about diabetes

- Expectations for treatments and outcomes

- Affect or mood

- General and diabetes related quality of life

- Review of available resources such as financial, social and emotional

- Routine screening for distress, depression, anxiety, disordered eating and cognitive capacities should be considered

- Diabetes distress (emotional responses)

2019 DM Guidelines: Psychosocial Issues, pp 62 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Obesity

- **Patients with diabetes should have their body mass index (BMI) calculated at every** healthcare provider visit and/or **telephonic interaction** to identify patients that are overweight and obese

- Treatment Options
  - **BMI 25-26.9 (23-26.9 Asian Americans): Diet, physical activity and behavioral therapy**
  - **BMI 27-29.9: Pharmacotherapy can be considered**
  - **BMI 30-34.9 (27.5-32.4 Asian Americans): Metabolic surgery may be considered, check covered benefits**

2019 DM Guidelines: Recommendation 8.1, pp 89 Table 8.1, pp 90 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Obesity and Weight Loss

- Overweight and obese patients that are ready to work on a weight loss program should have a weight loss goal of > 5% through a combination of diet, physical activity and behavioral therapy

- There are various weight loss medications which can be effective in combination with lifestyle modifications
  - Risk vs benefits of these medications should be reviewed prior to initiation of therapy
  - If there is <5% weight loss after 3 months, or if there are any safety or side effect issues the treatment should be discontinued

- Metabolic surgery can be an effective treatment for overweight/obese patients with type 2 diabetes:
  - If appropriate should be recommended treatment option for those with BMI >40 (37.5), and in those with BMI 35-39.9 (32.5-37.4) when diabetes is not well controlled despite lifestyle modifications and optimal medical therapy

2019 DM Guidelines: Psychosocial Issues, pp 62 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Type 2 Diabetes Prevention

- Those who have been diagnosed with prediabetes should be monitored at least yearly for the development of diabetes

- Prediabetes patients should be referred to an intensive behavioral lifestyle intervention program

- These programs should be modeled after the diabetes prevention program (DPP) which demonstrated that an intensive lifestyle intervention can reduce the future risk of diabetes significantly

- Goals of the program are to achieve and maintain a minimum of 7% weight loss and 150 minutes of physical activity per week

- Technology platforms may be able to assist and deliver core components of the DPP
  - ❖ Virtual small groups
  - ❖ Internet social networks
  - ❖ Mobile applications

2019 DM Guidelines: Diabetes Prevention, pp 38 / 204, http://care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Type 2 Diabetes Prevention

- Metformin (Glucophage®) should be considered to help prevent progression to type 2 diabetes

- Those with BMI ≥ 35 kg/m^2, < 60 years of age and women with prior history of GDM, care providers should consider metformin (Glucophage®) therapy

- Those with prediabetes should be screened and treated for modifiable risk factors for cardiovascular disease

2019 DM Guidelines: Recommendations, pp 39 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Treatment Targets

A1c Goals
- In most non-pregnant adults A1c goal should be < 7%
- A1c goal of < 6.5 may be suggested for select individuals if it can be attained without hypoglycemia or adverse effects
- A1c goal of < 8% may be appropriate for patients with significant comorbidities limited life expectancy, elderly (≥ 65 years) and severe hypoglycemia

Blood Glucose Goals
- In most non-pregnant adults, the goal of preprandial blood glucose should be between 80-130 mg/dL, and < 180 mg/dL postprandial

Hypoglycemia
- Glucose values of ≤ 70 mg/dL should trigger review of diabetic treatment regimen
- Glucose values of ≤ 54 mg/dL represents clinically significant hypoglycemia[1]
- Severe hypoglycemia is associated with significant cognitive impairment requiring assistance from another person[2]

[1]2019 DM Guidelines: Glycemic Targets, pp 69 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf and [2]Hypoglycemia, pp 48

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Diabetes Monitoring

Self-Monitoring of Blood Glucose (SMBG)
- Most individuals treated with intensive insulin regimens should self-monitor blood glucose. This is typically completed prior to meals and snacks, at bedtime, prior to exercising and after meals if needed.

- Those who are not treated with intensive regimens or who are taking non insulin based treatment, they should discuss with their provider if self-monitoring is needed[1]

A1c Testing
- Twice a year if at goal or quarterly if not at goal or if therapy has changed
- More frequent testing may be indicated in patients who are unstable or intensively managed[2]

2019 DM Guidelines: [1]Self-Monitoring Recommendation, pp 81 / 204 and [2]A1c Testing Recommendation, pp 39 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Technology – Check Benefits

Continuous Glucose Monitoring (CGM)

- Sensor Augmented Pump (SAP) may be considered in children, adolescents, and adults
- CGM requires extensive education, training, and support
- Useful in adults with type 1 diabetes who are not meeting glycemic targets
- Useful in those with hypoglycemia unawareness and/or frequent hypoglycemia

Intermittently Scanned Continuous Glucose Monitor (isCGM)

- Also known as "flash" CGM
- May be a substitute for SMBG in adults who require frequent glucose testing

2019 DM Guidelines: Diabetes Technology, pp 79 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42_Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Technology

Automated Insulin Delivery

- May be considered in children (> 7 years) and adults with type 1 diabetes to improve glycemic control
- Hybrid closed loop systems (HCL)
  - Differs from SAP in that HCL uses an algorithm to continually adjust doses of subcutaneous insulin
  - Requires user to bolus for meals and snacks

2019 DM Guidelines: Diabetes Technology, pp 79 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42_Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Treatment: Type 1

- Multiple daily injections combining both short and long acting insulins or continuous subcutaneous insulin infusion

- Rapid acting insulin to cover prandial needs reduce the risk of hypoglycemia

- Pramlintide (Symlin®): amylin analog
  - FDA approved for adults with type 1 diabetes
  - Can cause weight loss and lower insulin doses

2019 DM Guidelines: Pharmacologic Approaches, pp 98 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42_Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Treatments: Type 2

- Metformin (Glucophage®) monotherapy should be started upon the diagnosis of type 2 diabetes if tolerated, unless there are contraindications

- Dual therapy initiation
  - Consider if have A1c ≥ 1.5% above their goal A1c

- If A1c is ≥ 10% and/or blood glucose levels ≥ 300mg/dL or patients have symptoms of hyperglycemia or evidence of ongoing catabolism (weight loss)
  - Insulin therapy should be considered

[1]2019 DM Guidelines: Pharmacologic Therapy for Type 2 DM, Recommendation pp 100 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

Diabetes Treatment: Type 2 – Specific Indications

- In individuals with atherosclerotic cardiovascular disease, SGLT-2 inhibitors or GLP-1 agonists with proven CV disease benefit are recommended
  - SGLT-2 inhibitors: empagliflozin (Jardiance®), canagliflozin (Invokana®)
  - GLP-1 agonist: Liraglutide (Victoza®)
- Individuals with atherosclerotic CV disease at high risk of heart failure (HF) or who have HF
  - SGLT-2 inhibitors: empagliflozin, canagliflozin are preferred
- Individuals with chronic kidney disease consider
  - SGLT-2 inhibitor or GLP-1 agonist
- DM medications that may help with weight loss
  - SGLT-2 inhibitors, GLP-1 RA
- GLP-1 agonists are preferred over insulin in those who need greater lowering effect of an injectable medication

[1]2019 DM Guidelines: Pharmacologic Therapy for Type 2 DM, Recommendation pp 100 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

Diabetes Comorbidity

- Cardiovascular disease (CVD) is the major cause of morbidity and mortality in those with diabetes

- Common risk factors coexist with diabetes such as hypertension and dyslipidemia

- Diabetes is also an independent risk factor for CVD

- **Hypertension:** Defined as a sustained blood pressure ≥140/90 mmHg, is common among patients with either type 1 or type 2 diabetes. Hypertension is a major risk factor for both ASCVD and microvascular complications. Targets should be individualized

  - Target BP <140/90 mmHg for those at lower risk for CVD
  - Lower target of 130/80; considered for those at high risk for CVD if it can be safely attained

[1]2019 DM Guidelines: Cardiovascular Disease, Risk Factors and Recommendations, pp 111 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

Diabetes Treatments

Antiplatelet Therapy
- Acetylsalicylic acid-NSAID (Aspirin®) 75-162 mg/day may be consider as primary prevention for high risk individuals with a history of diabetes and atherosclerotic cardiovascular disease

- Acetylsalicylic acid-NSAID (Aspirin®) has been shown to be effective for secondary prevention for those with a history of previous MI or stoke

- Clopidogrel (Plavix®) 75 mg/day can be used as alternative for those with Aspirin® allergy

[1]2019 DM Guidelines: Antiplatelet Agents Recommendations, pp 121 / 204, care.diabetesjournals.org/content/diacare/suppl/ 2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Treatments

Lifestyle Modifications- Dyslipidemia
- Weight loss and reduction in saturated fat, trans fat and cholesterol intake
- Increase physical activity, fiber, and omega 3 fatty acids

Statins Indicated with These Risk Factors
- High intensity statins should be started in all patients with diabetes and atherosclerotic heart disease
- Age <40 with atherosclerotic risk factors, moderate intensity statin should be considered
- Age >40 without ASCVD, moderate intensity statin should be considered
- If low-density lipoprotein (LDL) is >70 on a maximally tolerated statin in those with ASCVD, additional LDL lowering treatment should be considered (PCSK9 INH)

[1]2019 DM Guidelines: Lipid Management and Statin Treatment Recommendations, pp 117 / 204, care.diabetesjournals.org/content/diacare/suppl/ 2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Complications

Diabetic Kidney Disease
- Spot urinary albumin to creatinine ratio at least yearly
- Occurs in 20-40% of patients
- Is a leading cause of end-stage renal disease (ESRD)
- Test type 1 diabetes with disease duration of at least 5 years
- Test type 2 diabetes at time of diagnosis and yearly thereafter
- All patients with diabetes with hypertension

Diabetic Retinopathy
- Glaucoma, cataracts and other eye disorders are common in patients with diabetes
- Type 1 diabetes should start routine screening within 5 years of diagnosis
- Type 2 diabetes should start routine screening at time of diagnosis

2019 DM Guidelines: Microvascular Complications, pp 132 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42. Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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Diabetes Complications

Diabetic Neuropathy

- Type 1 diabetes
  - Screening should start 5 years after diagnosis

- Type 2 diabetes
  - Screening should start at time of diagnosis

- A full comprehensive foot exam should occur annually

- All patients with diabetes should have their feet examined at every healthcare provider visit

- General foot care and education should be provided to all those patients with diabetes

2019 DM Guidelines: Neuropathy, pp 139 / 204, care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf

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"What Worse Looks Like"

Worsening Symptoms of DM Such as:

- **New or worsening increase in urination**
- **Very high or very low blood glucose level**
- **Excessive thirst**
- **New or worsening confusion or memory loss**
- **Fruit-scented breath**
- **Loss of Consciousness**
- **Sudden weight loss**
- **Difficulties Breathing**
- **Intense stomach pain**
- **Vomiting**

ADA, What are the Warning Signs of DKA?, www.diabetes.org/living-with-diabetes/complications/ketoacidosis-dka.html

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Diabetes Ethics - Thought Provoking Questions

Continuation of providing care to non-compliant patients?

Providing care to patient with diabetes and behavioral health problems?

Smoking during pregnancy and mom has diabetes?

Treatment to a patient without resources?

Distribution of resources?

Pancreas Transplantation?

Genetic Screening?

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Care Management of DM

Right Provider
- *PCP*
- *Endocrinologist*
- *Behavioral Health*
- *Nutritionist*

Right Medications
- *Insulin Long Acting*
- *Insulin Short Acting*
- *Metformin*
- *Combined Therapy*

Right Care
- *Identifying Cause of Diabetes*
- *Glucose Self-Monitoring*
- *A1c Monitoring*
- *Foot Examinations*
- *Treatment and Prevention of Comorbidities*

Right Lifestyle
- *Smoking Cessation*
- *Nutrition*
- *Physical Activity*
- *Achieve and Maintain Healthy Weight*
- *Avoid ETOH Abuse*

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Thank You

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