

Adult-Onset Type 1 Diabetes (Latent Autoimmune Diabetes in Adults - LADA): Patient Explanation

What is Adult-Onset Type 1 Diabetes?

Adult-onset Type 1 diabetes, also known as **Latent Autoimmune Diabetes in Adults (LADA)**, is a form of Type 1 diabetes diagnosed in adulthood. It occurs due to an autoimmune process where the body's immune system attacks insulin-producing beta cells in the pancreas.

Causes

- **Autoimmune Reaction:** The immune system mistakenly destroys beta cells, reducing insulin production.
 - **Triggers:** Environmental factors (e.g., viral infections or stress) may activate the autoimmune response in genetically susceptible individuals.
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Onset

- Slower progression compared to childhood Type 1 diabetes.
 - Often misdiagnosed as Type 2 diabetes initially because it appears later in life and progresses more gradually.
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Genetic Risk Factors

- Family history of autoimmune diseases increases risk.
 - Specific genes like HLA-DR3 and HLA-DR4 are associated with LADA.
 - Presence of autoantibodies (e.g., GAD65, ICA) confirms autoimmune activity.
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How Diet, Exercise, and Weight Affect Glucose

- **Diet:** Healthy eating can stabilize blood glucose, but diet alone cannot manage LADA due to lack of insulin.
- **Exercise:** Improves insulin sensitivity and helps lower glucose levels.
- **Weight:** Unlike Type 2 diabetes, LADA is less associated with obesity, but maintaining a healthy weight aids overall health.

Symptoms

- Increased thirst (**polydipsia**)
- Frequent urination (**polyuria**)
- Fatigue
- Unexplained weight loss
- Blurred vision
- Slow-healing wounds
- Symptoms may overlap with Type 2 diabetes, causing diagnostic confusion.

Normal Glucose and A1c Levels

- **Normal Glucose Range:**
 - Fasting: 70–99 mg/dL
 - Post-meal: <140 mg/dL
- **Normal A1c: <5.7%**
- **Pre-diabetes A1c = 5.7% to 6.4%**
- **Diabetes A1c = or >6.5%**

Testing for Adult-Onset Type 1 Diabetes

1. **Autoantibody Tests:**
 - GAD65 (glutamic acid decarboxylase) antibodies.
 - Islet cell antibodies (ICA).
 - Insulin autoantibodies (IAA).
2. **C-Peptide Test:**
 - Measures insulin production.
 - Low levels indicate reduced beta-cell function.
3. **Oral Glucose Tolerance Test (OGTT):**
 - Evaluates blood glucose response to a sugar load.

Age of Onset

- Typically diagnosed between 30–50 years old.
 - Progression to insulin dependence is slower than in childhood Type 1 diabetes.
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Treatment

1. **Insulin Therapy:** The main treatment as the pancreas cannot produce enough insulin.
 - Used when other treatments are insufficient.
 - **Basal Insulin:** Long-acting insulin for maintaining baseline glucose levels (e.g., Glargine, Lantus, Toujeo, Tresiba, Basaglar).
 - **Bolus Insulin:** Rapid-acting insulin for meals and corrections (e.g., Novolog, Humalog, Lyumjev, Admelog, Fiasp, Apidra). Novolin R and Humulin R used less often.
 - **Intermediate Insulin:** Humulin N, Novolin N, NPH, used less often today.
 2. **Glucose Monitoring:**
 - **Continuous Glucose Monitors (CGMs):** Provide real-time glucose levels (e.g., Dexcom, Freestyle Libre).
 - **Fingerstick Meters:** Spot checks of blood glucose.
 3. **Lifestyle Changes:**
 - Healthy diet (low-carb, high-fiber).
 - Regular exercise.
 - Weight management.
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Why Metformin and Glipizide are Ineffective

- **Metformin:**
 - Reduces liver glucose production but does not address lack of insulin production in LADA.
 - May have mild effects initially.
 - **Glipizide:**
 - Stimulates insulin secretion from beta cells, but as beta cells are destroyed, its efficacy decreases.
 - **Side Effects:** Hypoglycemia (glipizide), nausea, and diarrhea (metformin).
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GLP-1 Hormones

- Mimic a natural hormone that:
 - Enhances insulin secretion in response to meals.
 - Reduces appetite and slows stomach emptying.
 - **Benefits:** Lower A1c (~1–1.5%), weight loss, and cardiovascular protection.
 - **Side Effects:** Nausea, vomiting, diarrhea, and rare risk of pancreatitis.
 - **Examples:**
 - **Examples:** Semaglutide (Ozempic, Wegovy), Liraglutide (Victoza), Dulaglutide (Trulicity), Tirzepatide (Mounjaro, Zepbound)
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SGLT2 Inhibitors

- Block glucose reabsorption in the kidneys, leading to glucose excretion in urine.
 - **Benefits:**
 - Lower A1c (~0.5–1%).
 - Promote weight loss.
 - Protect heart and kidney health.
 - **Side Effects:** Urinary tract infections, genital yeast infections, dehydration.
 - **Examples:**
 - Empagliflozin (Jardiance), Dapagliflozin (Farxiga), Canagliflozin (Invokana), Ertugliflozin (Steglatro), Bexagliflozin (Brenzavvy only from Marley Pharmacy lowest price)
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Glucose Sensors and Insulin Pumps

- **CGMs:** Offer continuous monitoring and reduce the need for frequent fingersticks.
 - **Insulin Pumps:** Provide automated insulin delivery with programmable basal and bolus doses. Some are integrated with CGMs for advanced glucose control.
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Complications of Poorly Controlled Diabetes

- **Short-Term:**
 - Hyperglycemia.
 - Ketoacidosis (DKA).
 - **Long-Term:**
 - Neuropathy (nerve damage).
 - Retinopathy (eye damage).
 - Nephropathy (kidney failure).
 - Cardiovascular disease (heart attack, stroke).
 - Foot ulcers or amputations.
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Benefits of Well-Controlled Diabetes

- Prevents complications.
 - Stabilizes blood sugar levels.
 - Improves energy, mood, and quality of life.
 - Prolongs life expectancy.
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Glucose Goal Target Ranges

- **Fasting/Pre-meal:** 80–130 mg/dL.
 - **Post-meal (1–2 hours):** <180 mg/dL.
 - **Target A1c:** <7.0% (individualized based on age and health).
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Key Takeaways

LADA requires a combination of proper diagnosis, insulin therapy, lifestyle changes, and monitoring. Effective management can significantly improve health outcomes and prevent complications.