Type 1 vs. Type 2

vs. Other ones

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Diabetes mellitus

Diseases of abnormal carbohydrate metabolism that are characterized by hyperglycemia

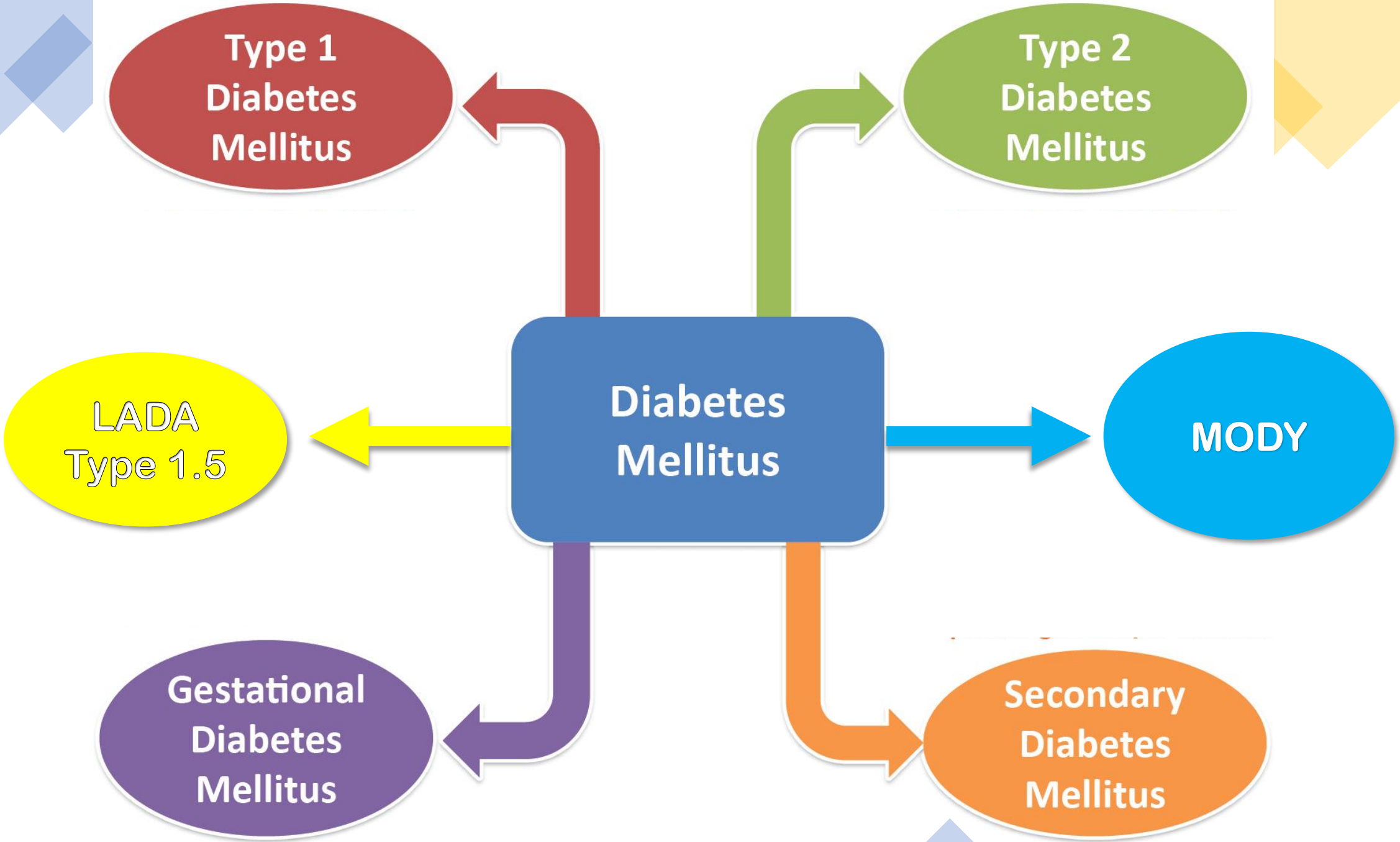
Etiology: insulin deficiency and/or insulin resistance

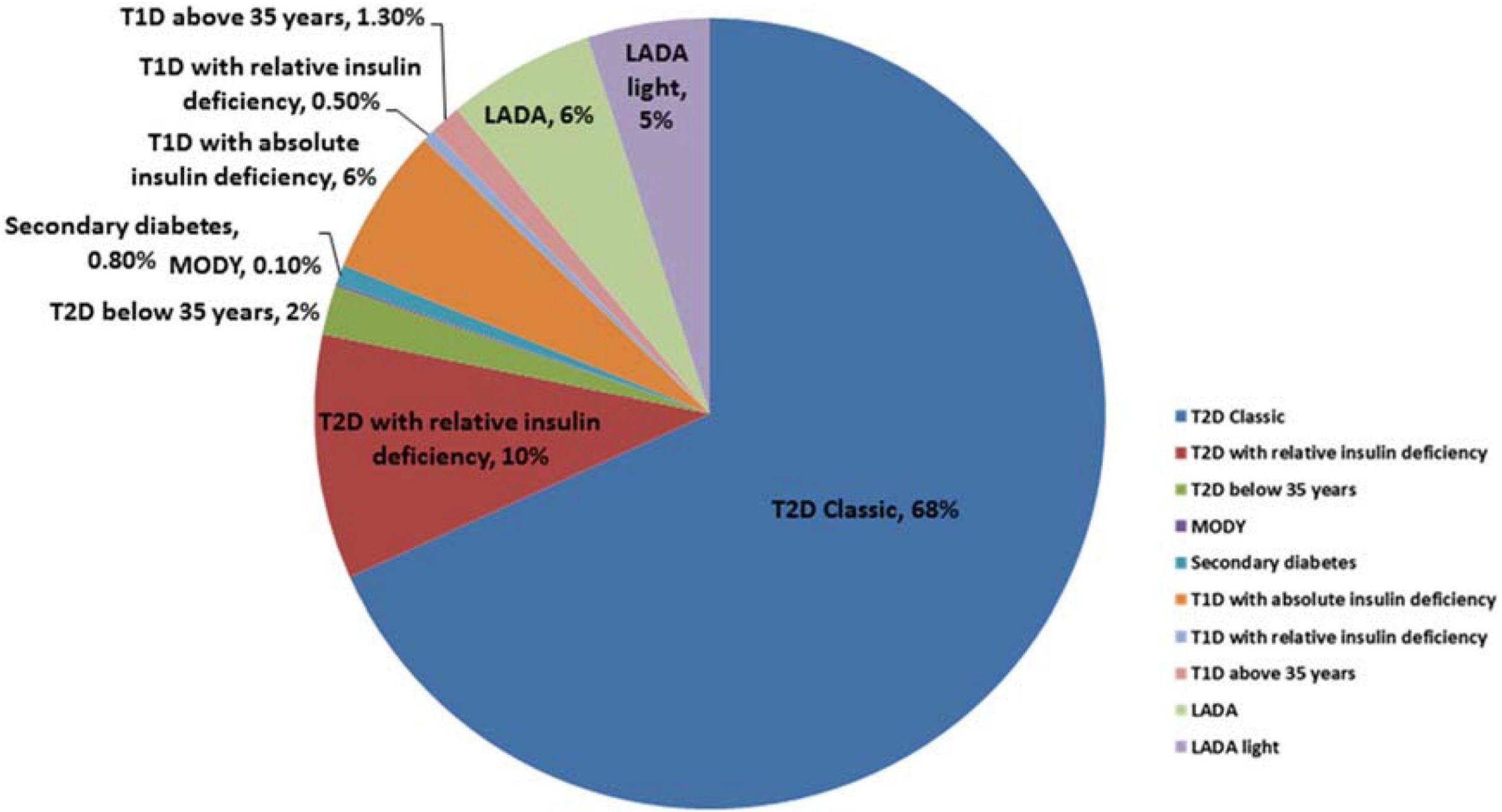
Insulin deficiency vs. Insulin resistance

DM Type	Insulin/C-peptide	Antibodies
Type 2	High	-
Type 1	Very Low	+

Comparison of type 1 and 2 diabetes		
Feature	**Type 1 diabetes**	**Type 2 diabetes**
Onset	Sudden	Gradual
Age at onset	Any age (mostly young)	Mostly in adults
Body habitus	Thin or normal	Often obese
Ketoacidosis	Common	Rare
Autoantibodies	Usually present	Absent
Endogenous insulin	Low or absent	Normal, decreased or increased
Concordance in identical twins	50%	90%

www.ncbi.nlm.nih.gov/books/NBK1671/


Type 1 Diabetes Mellitus
Type 2 Diabetes Mellitus
LADA Type 1.5
Diabetes Mellitus
MODY
Gestational Diabetes Mellitus
Secondary Diabetes Mellitus



Genes **2015**, *6*(1), 87-123

LADA: latent auto-immune diabetes of adults

Slowly progressive form of autoimmune diabetes with serum immune markers of T1D (GAD-65 Ab) but not requiring insulin at diagnosis.

Clinically and metabolically a **hybrid** between T2D and T1D.

LADA vs. T1D

Age >30 years

β-cell function is lost more gradually than in **type 1** diabetes but more rapidly than in **type** 2 diabetes

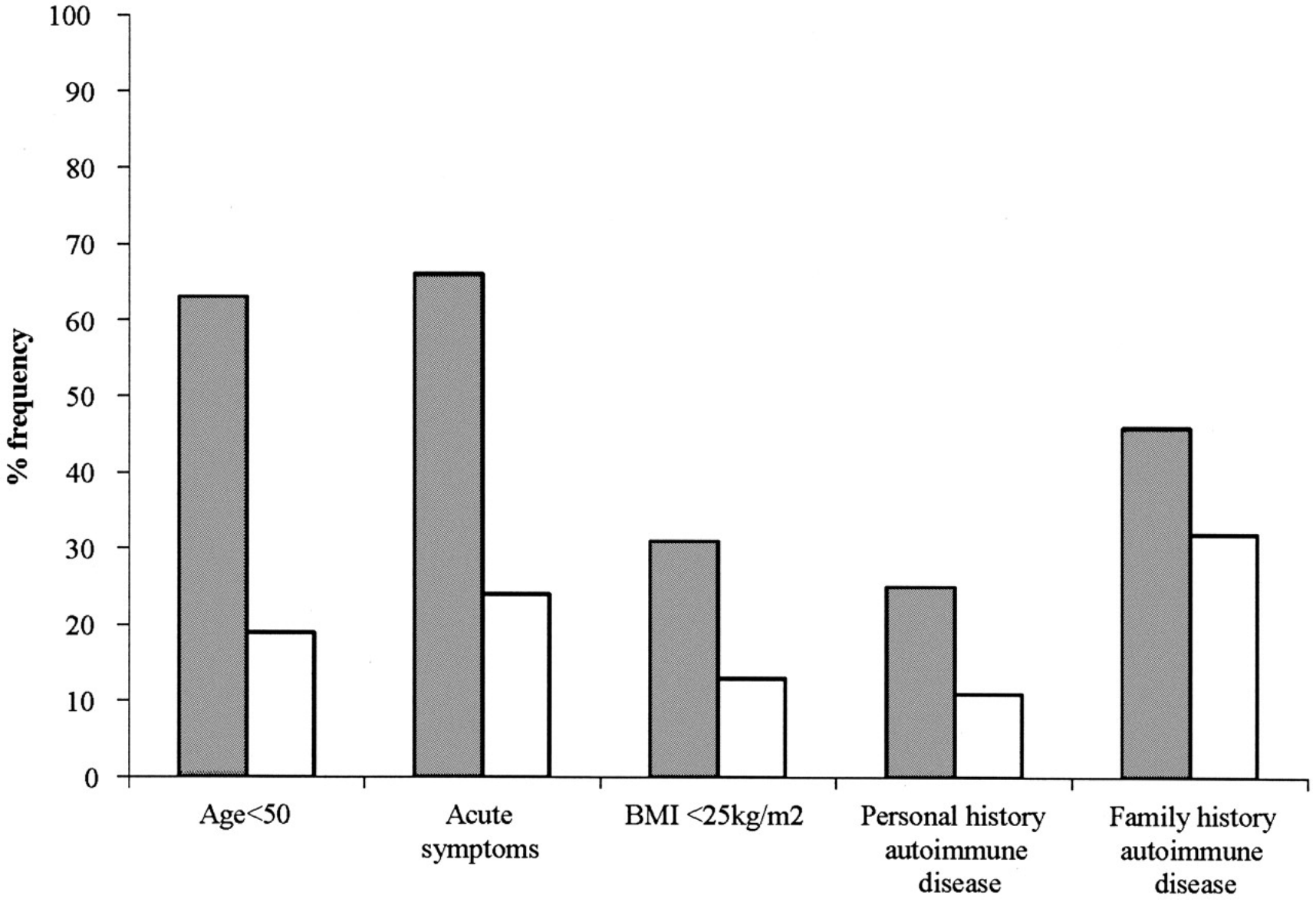
Non–insulin requiring at onset of diabetes - they often require insulin therapy after 6 months but within 5 years of diagnosis

DKA is very rare

Diabetes 2020 Oct; 69(10): 2037-2047

Diabetes Spectrum 2016 Nov; 29(4): 249-252

LADA vs. T2D



Fourlanos S et al. Dia Care 2006;29:970-975

LADA Clinical Risk Score

1. Age <50
2. Acute symptoms
3. BMI <25
4. Personal history of autoimmunity
5. Family history of autoimmunity

≥2 90% sensitivity and 71% specificity for identifying LADA

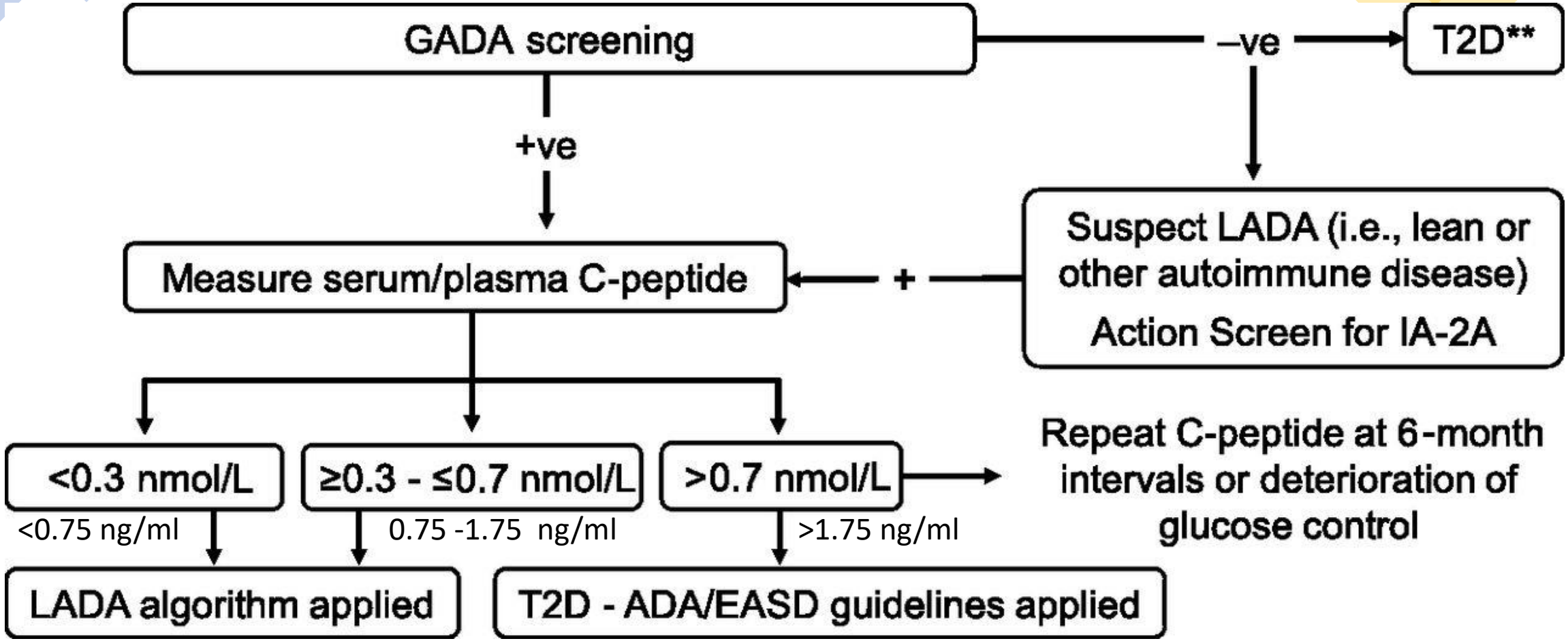
≤1 Negative predictive value of 99%.

Fourlanos S et al. Dia Care 2006;29:970-975

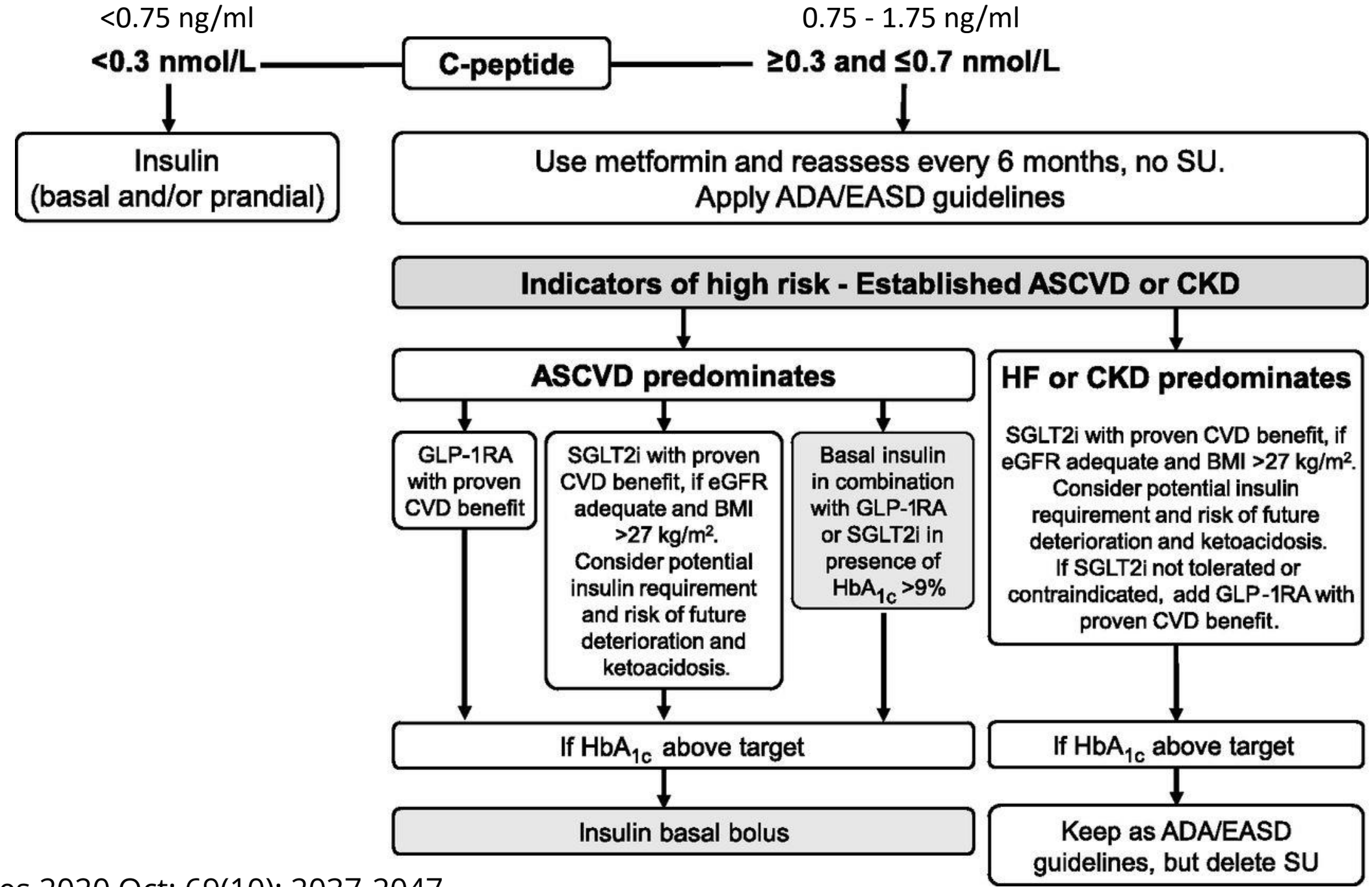
Clinical presentations that may warrant measurement of auto-antibodies and C-peptide:

- Catabolic presentation (eg, weight loss, ketonuria)
- Lean body habitus with no features of metabolic syndrome
- Personal history of autoimmune diseases
- Strong family history of autoimmune disease, including type 1 diabetes
- Overweight or obese adolescents or young adults presenting with apparent type 2 diabetes, who actually may have an early presentation of type 1 diabetes

	C-PEPTIDE LOW	C-PEPTIDE HIGH
GAD-65 Ab NEGATIVE	LADA	T2D
GAD-65 Ab POSITIVE	T1D	LADA



Diabetes 2020 Oct; 69(10): 2037-2047.



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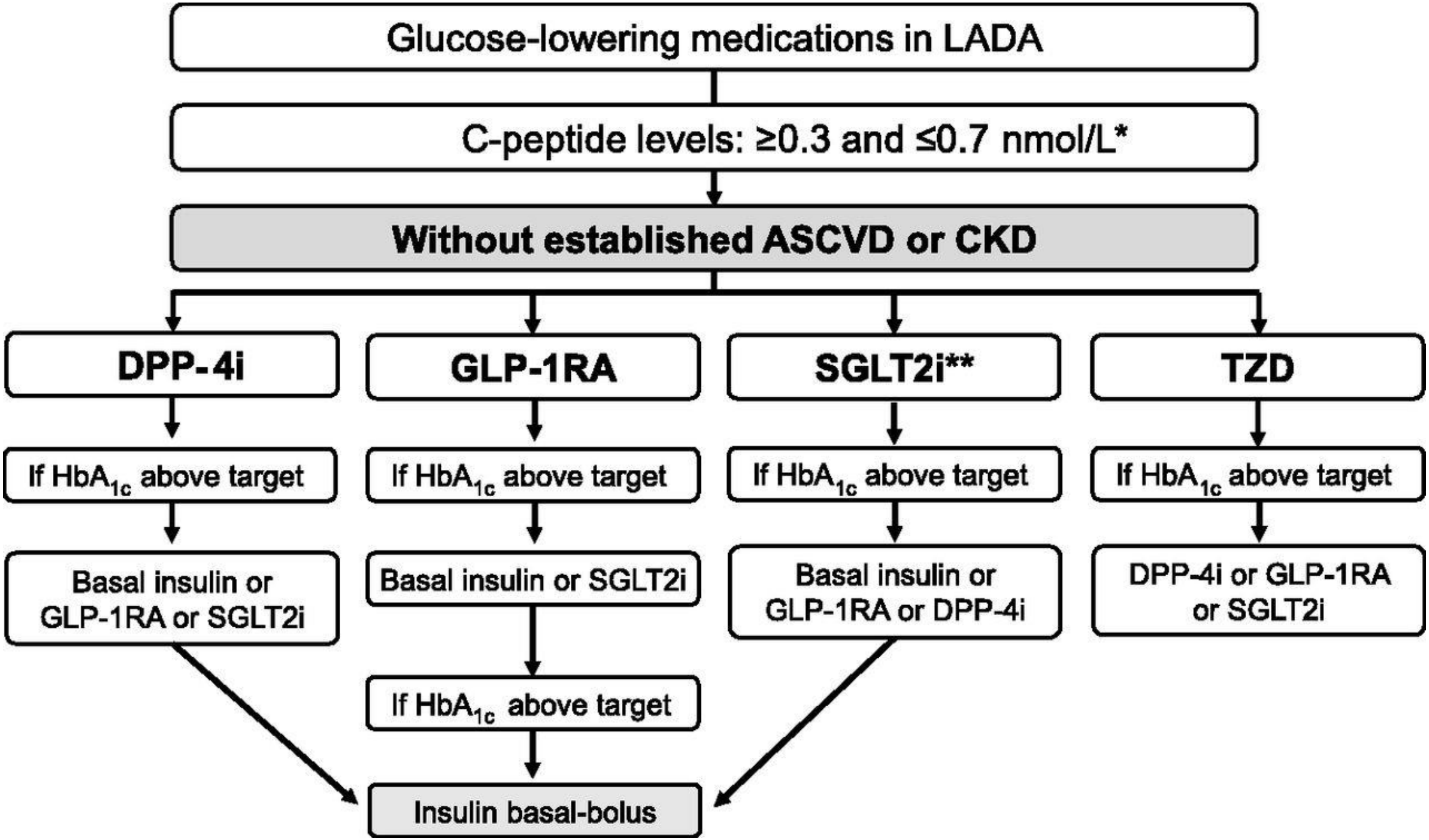
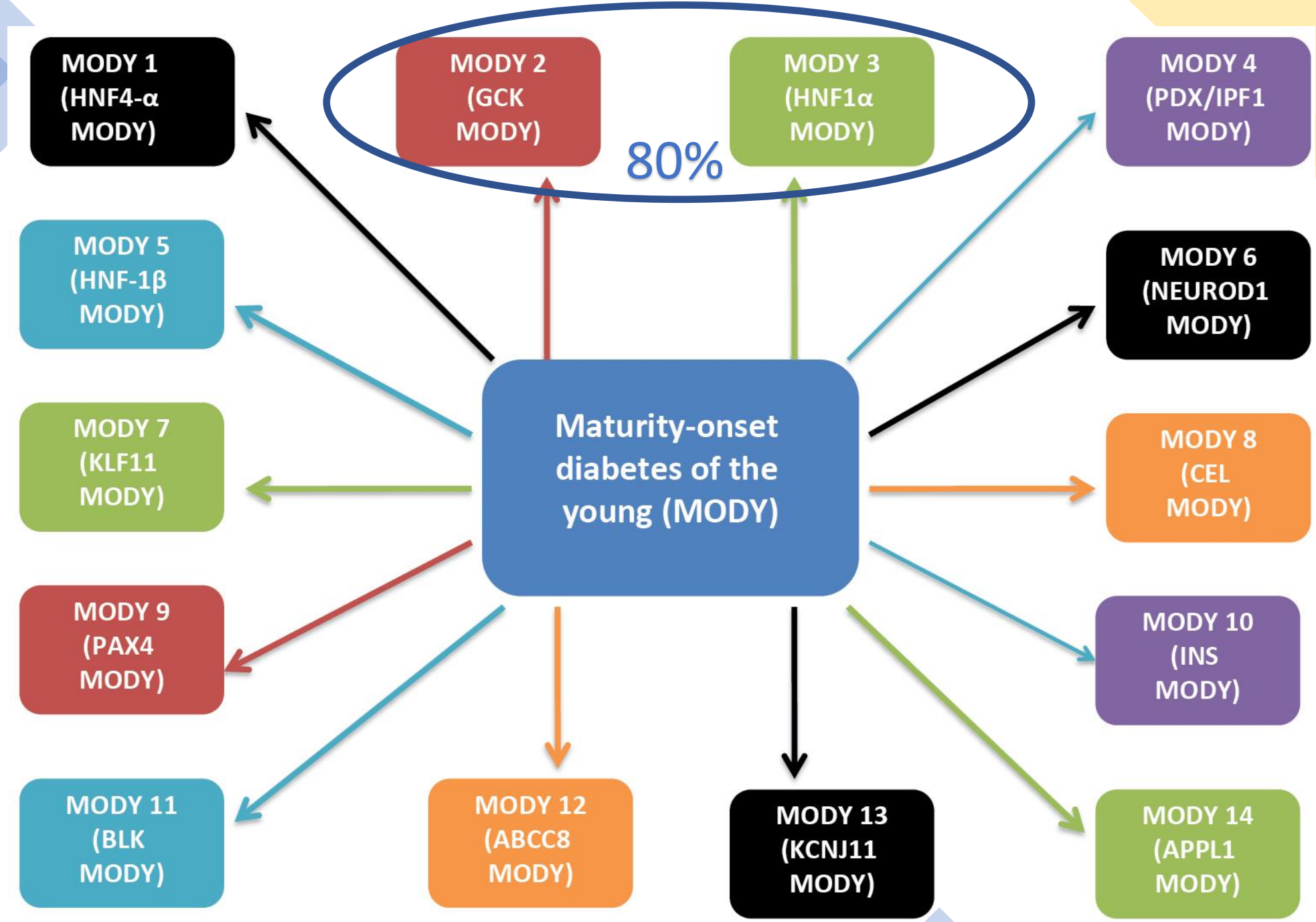


Diabetes 2020 Oct; 69(10): 2037-2047.

MODY: maturity-onset diabetes of the youth

- Monogenic, usually autosomal dominant inheritance pattern
- Usually presents before age 25
- <2% of all patients with diabetes
- Some of these are responsive to Sulfonylurea treatment


MODY 1 (HNF4-α MODY)
MODY 2 (GCK MODY)
MODY 3 (HNF1α MODY)
80%
MODY 4 (PDX/IPF1 MODY)
MODY 5 (HNF-1β MODY)
MODY 6 (NEUROD1 MODY)
MODY 7 (KLF11 MODY)
Maturity-onset diabetes of the young (MODY)
MODY 8 (CEL MODY)
MODY 9 (PAX4 MODY)
MODY 10 (INS MODY)
MODY 11 (BLK MODY)
MODY 12 (ABCC8 MODY)
MODY 13 (KCNJ11 MODY)
MODY 14 (APPL1 MODY)

Secondary DM

Pancreatic disease	Endocrine do.	Medication-induced
• Chronic pancreatitis • Pancreatic Cancer • Viral pancreatitis • Cystic fibrosis • Hemochromatosis • Surgical	• Cushing's Syndrome • Acromegaly • Thyrotoxicosis	• Post-transplant DM • Glucocorticoids • Anti-psychotic meds • Protease inhibitors • Interferon-alpha • Etc.

Pancreatic Cancer

Routine screening for pancreatic cancer in patients with new-onset type 2 diabetes is **not recommended but can be considered** in atypical patients:

- older individuals with lean body habitus
- in the settings of weight loss, abdominal pain or nausea, or abnormal liver tests indicating cholestasis.

Insulin deficiency vs. Insulin resistance

DM Type	Insulin/C-peptide	Antibodies
Type 2	High	-
Type 1	Very Low	+
LADA (Type 1.5)	Low → Very Low	+/- (- → +)
MODY	High or Low	-
Secondary	High or Low	-
GDM	High	-


QUESTIONS