MiCMRC Educational Webinar

Caring for the Diabetic Patient: Understanding Diabetes

March 27, 2018

micmrc

The Michigan Care Management Resource Center

MiCMRC Educational Webinar

Caring for the Diabetic Patient: Understanding Diabetes

Expert Presenter:

Dianne Conrad DNP, FNP-BC, BC-ADM, CDE, FNAP

Associate Professor, Kirkhof College of Nursing, Grand Valley State University, Grand Rapids, MI

Family Nurse Practitioner, Cadillac Family Physicians, Cadillac, MI

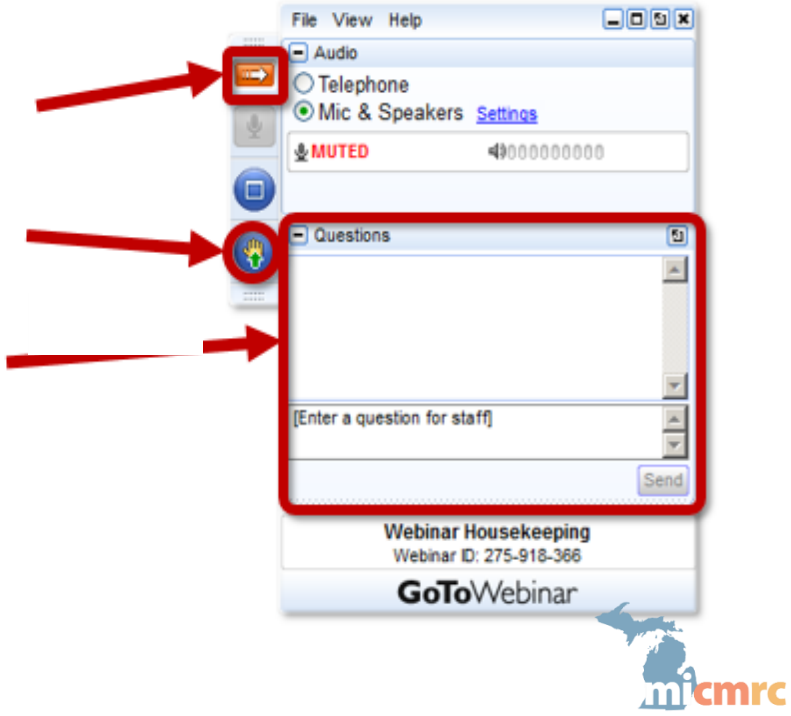

Michigan Care Management Resource Center
Search...
micmrc
Home
Training & Support
Care Management 101
Topics
Resources
Webinars
Best Practices
New! Available Now
MiCMRC CareManagement eLearningCourses
Free online lessons
Learn at your own pace
Earn CE Credit
Programs MiCMRC Supports
MiCMRC provides training and support for the following statewide Care Management initiatives:
BCBSM Provider-Delivered Care Management
BCBSM PDCM-Specialists
SIM - PCMH Initiative
Comprehensive Primary Care Plus (CPC+)
High Intensity Care Model
Continuing Education
Select MiCMRC activities offer the opportunity to obtain free CE credits in Nursing or Social Work suitable for Michigan professional licensing requirements. Click here for more information regarding CE activities...
MiCMRC Complex Care Management Course
The MiCMRC Complex Care Management course is designed to prepare the healthcare professional for the role of Complex Care Manager. Read More
MiCMRC-Approved Self-Management Support Programs
MiCMRC approves Self-Management Support Programs. For a detailed summary listing program objectives, resources, tools, locations and more, click to view or download the PDF file
Care Management Connection Newsletter
Keep up with the latest care management news from MiCMRC. Click for the latest or past issues ...
Share Your Success Story
MiCMRC wants to hear about and share success stories in care management, team-based care and high intensity care management (HICM). Click here to share yours...
Upcoming Webinars
MiCMRC Educational Webinar
Wednesday, April 26, 2017 - 2:00pm
DIABETES
CHRONIC CONDITIONS
Diabetes Prevention
Presented by
Tamah Gustafson, MPH, CPH, CHES
Kim Lombard, MS, RD, CDE
Webinar Registration
MiCMRC Educational Webinar
Wednesday, May 24, 2017 - 2:00pm
PAIN MANAGEMENT
Pain Assessment in Ambulatory Care - Time to Repeal and Replace the Pain Score
Presented by
Terri Voepel-Lewis, PhD RN
Webinar Registration

Housekeeping: Webinar Toolbar Features

Collapse Toolbar

Raise Your Hand

Ask a Question



micmrc

Disclosures

- The planners have reported no relevant conflict of interest for the purpose of the MiCMRC Educational webinar “Caring for the Diabetic Patient: Understanding Diabetes”.
- There is no commercial support for this activity.
- This webinar is available for CE credit until 2/14/2020.
- Participants who successfully view the entire live or recorded webinar and complete the online CE process including required evaluation with email address will earn 1.0 contact hours.
- This continuing nursing education activity was approved by the Ohio Nurses Association, an accredited approver by the American Nurses Credentialing Center’s Commission on Accreditation. (OBN-001-91)

Instructions for Obtaining Nursing, Social Work, and CCMC CE Credit

To receive Nursing or Social Work 1.0 continuing education contact hour for "Caring for the Diabetic Patient: Understanding Diabetes" for Today's Live Webinar 3/27/2018 2:00 – 3:00 PM

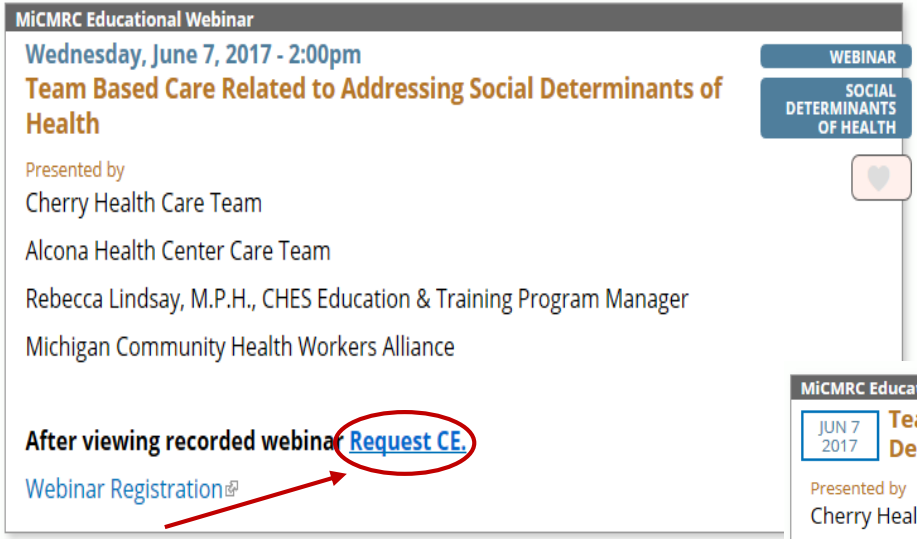
- Attend the entire webinar

- Go to the Michigan Care Management Resource Center web site http://micmrc.org/webinars

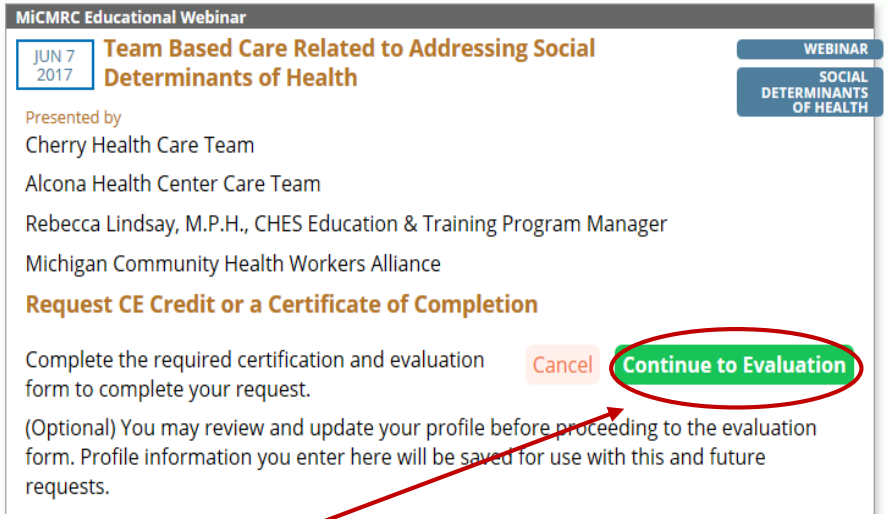
- On the micmrc web site webinar page, locate the "*Caring for the Diabetic Patient: Understanding Diabetes" webinar information*
  - Click the link titled **To Request CE Credit Click Here**
  - Complete the brief form, include your e-mail address, click submit
    - This will generate an ***email message to you containing a link to complete the CE request and required evaluation form***
    - Follow instructions in the e-mail: Complete the evaluation and submit. This step generates an email to you containing the CE certificate

**Note*: This webinar will be recorded. CE for viewing the recorded webinar will be available on http://micmrc.org/webinars soon. The recorded webinar will be available for Nursing and Social Work CE credit until 2/14/2020.

For technical assistance please e-mail: micmrc-requests@med.umich.edu



Click link shown to start CE process



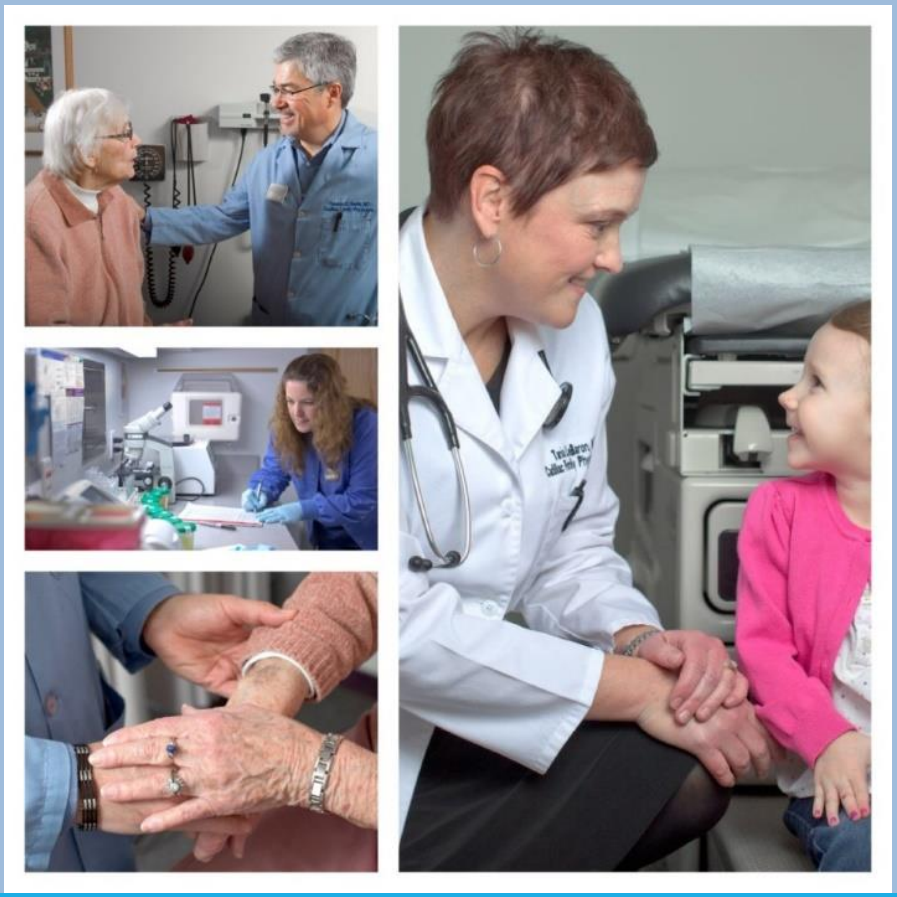
Click on evaluation link to complete CE process

Caring for the Diabetic Patient: Understanding Diabetes

DIANNE CONRAD DNP, FNP-BC, BC-ADM, CDE, FNAP

- **Cadillac Family Physicians, PC**

Cadillac, MI



Grand Rapids, MI

- Kirkhof College of Nursing

GRAND VALLEY STATE UNIVERSITY
www.gvsu.edu

Objectives

1. Describe the disease process and progression in the patient diagnosed with Type 1 or Type 2 Diabetes.
2. Discuss the effect of acute illness on diabetes glycemic control.
3. Describe care management issues in a patient with diabetes transitioning from acute to primary care.

Diabetes Mellitus

- **Derived from Greek word for "fountain" and Latin word for "honey"**

- **From Polyuria of untreated Diabetes and the Sweet Smell/Taste of the urine**

Types of Diabetes

Type 1 Diabetes

Type 2 Diabetes

Gestational Diabetes

Type 1 DM

Most commonly diagnosed among Caucasians

Peaks at 12 yrs of age

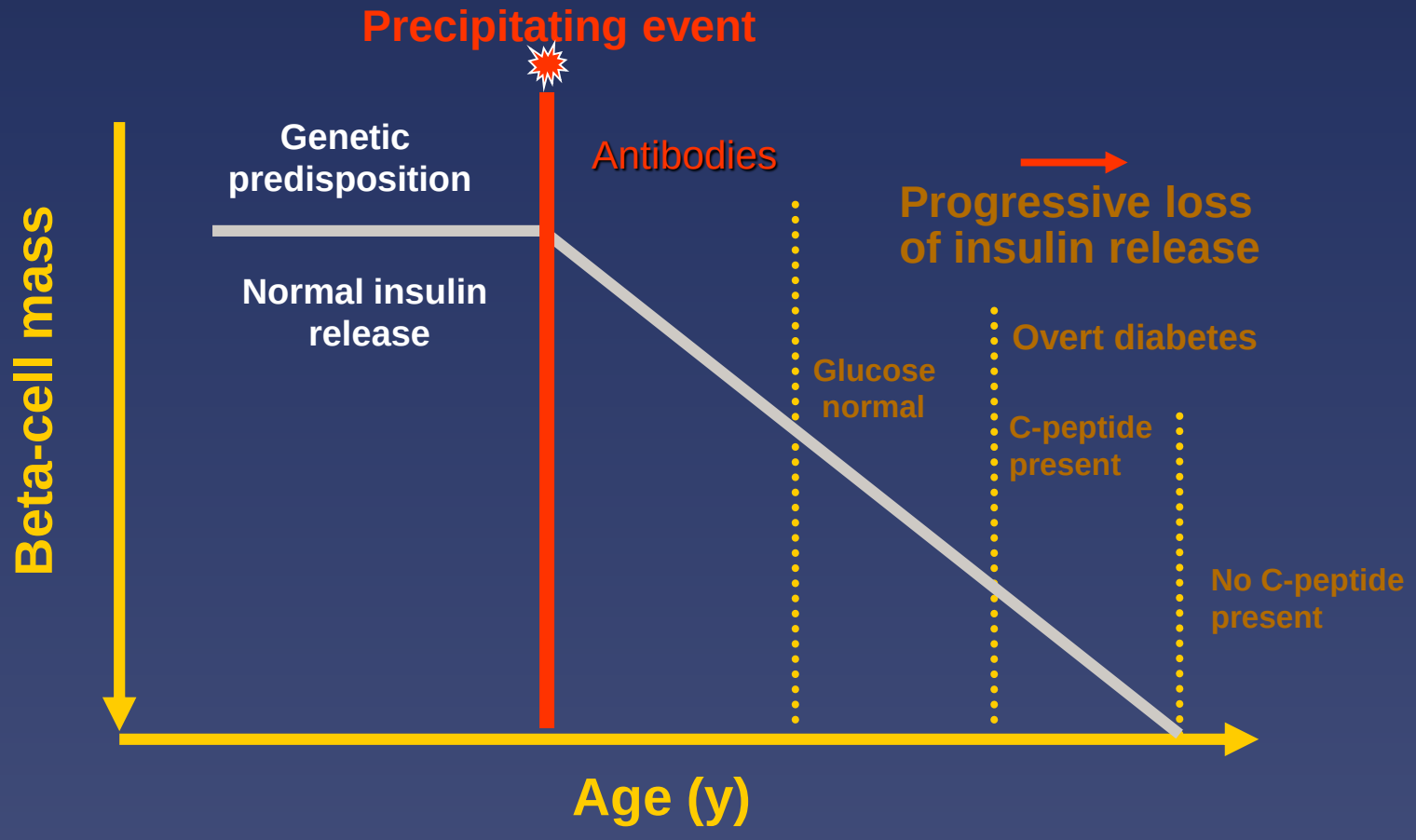
Characterized by immune process in genetically susceptible individuals

Beta cell destruction and Islet Cell Antibody appearance

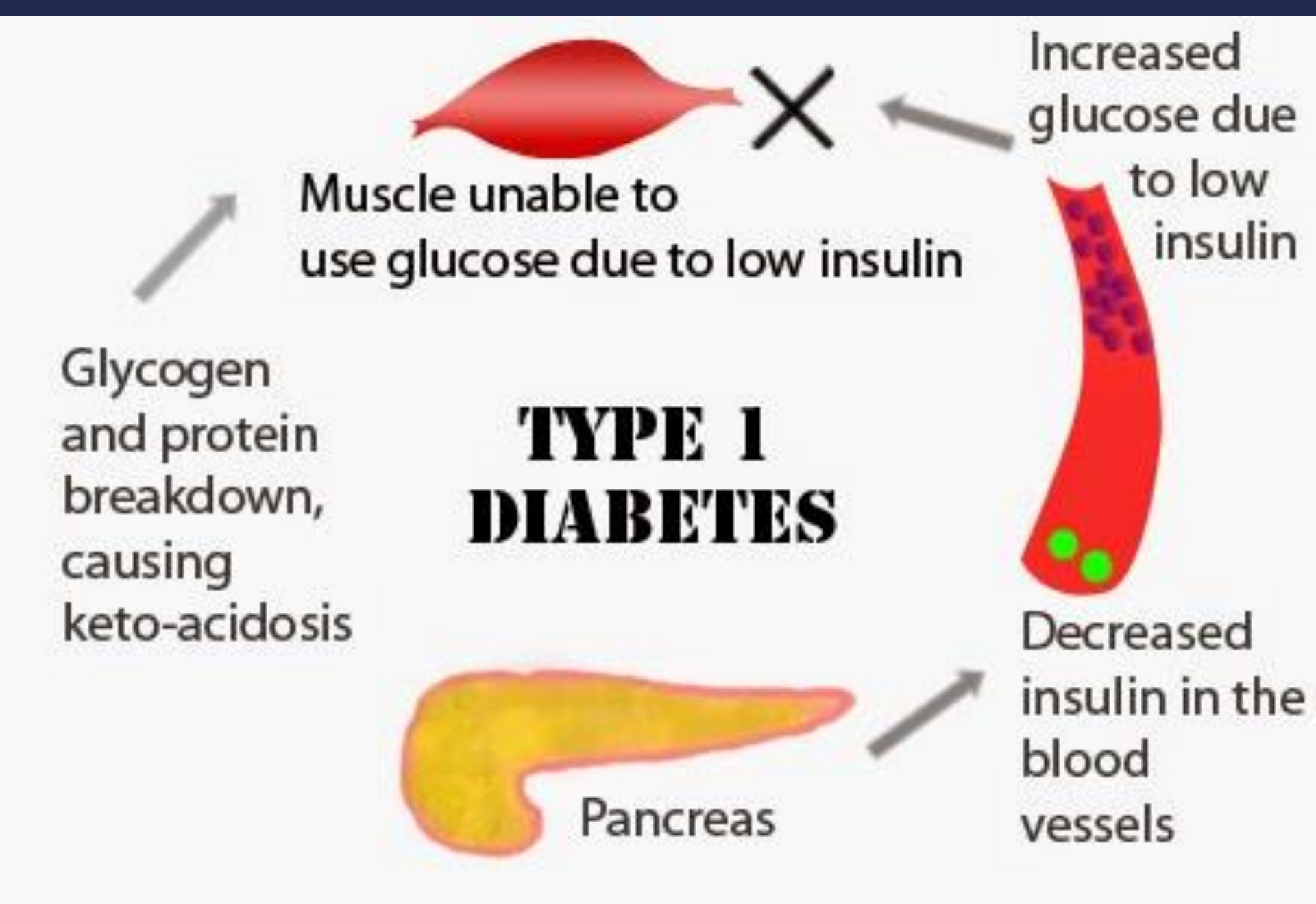
Macrophages T & B lymphocytes and natural killer cells often present

Viral infections likely cause autoimmune damage to beta cells

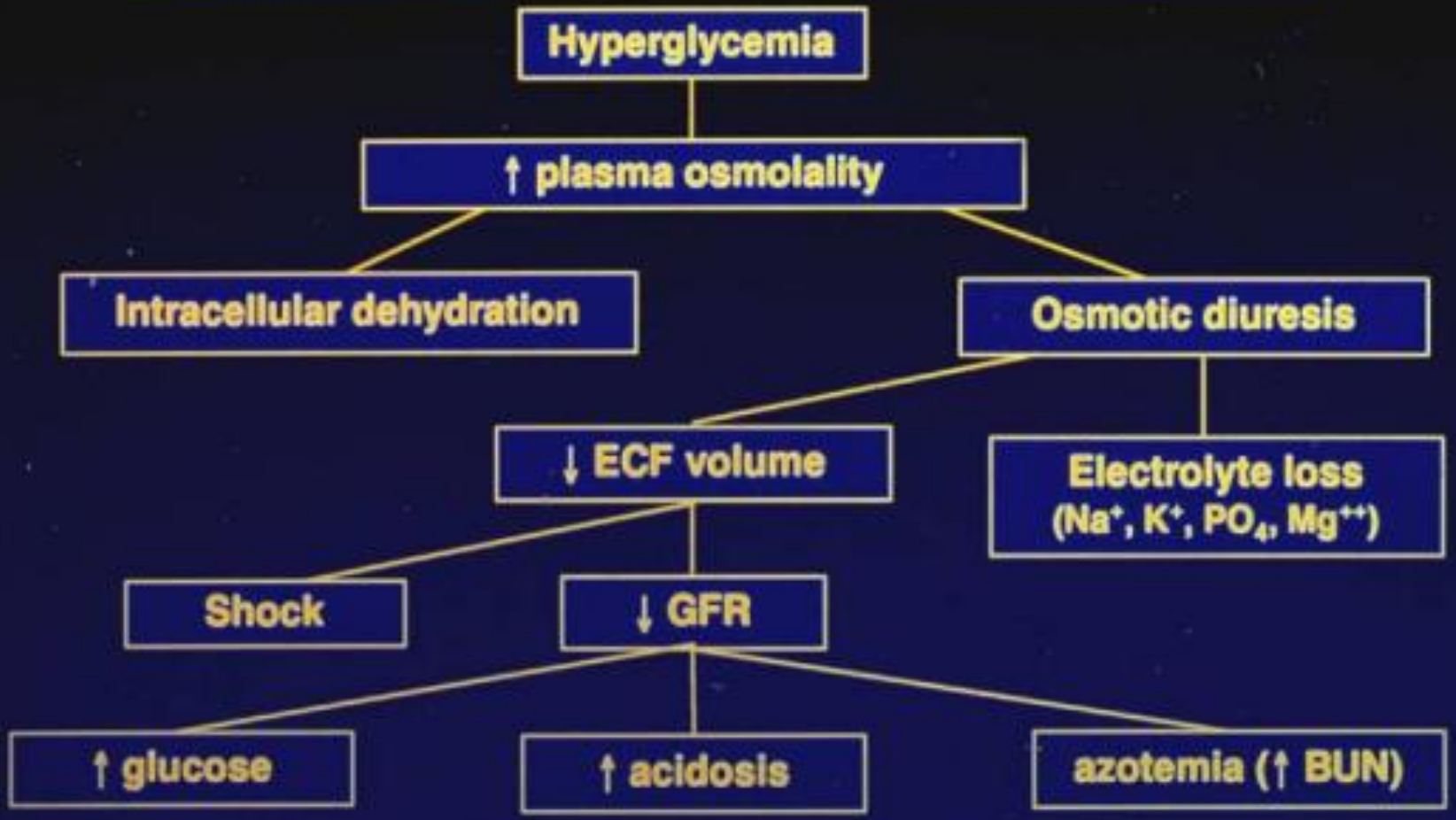
Progression of Type 1 Diabetes



Adapted from Atkinson. *Lancet.* 2002;358:221-229.


Increased glucose due to low insulin
Muscle unable to use glucose due to low insulin
Glycogen and protein breakdown, causing keto-acidosis
TYPE 1 DIABETES
Decreased insulin in the blood vessels
Pancreas

Diabetic Ketoacidosis

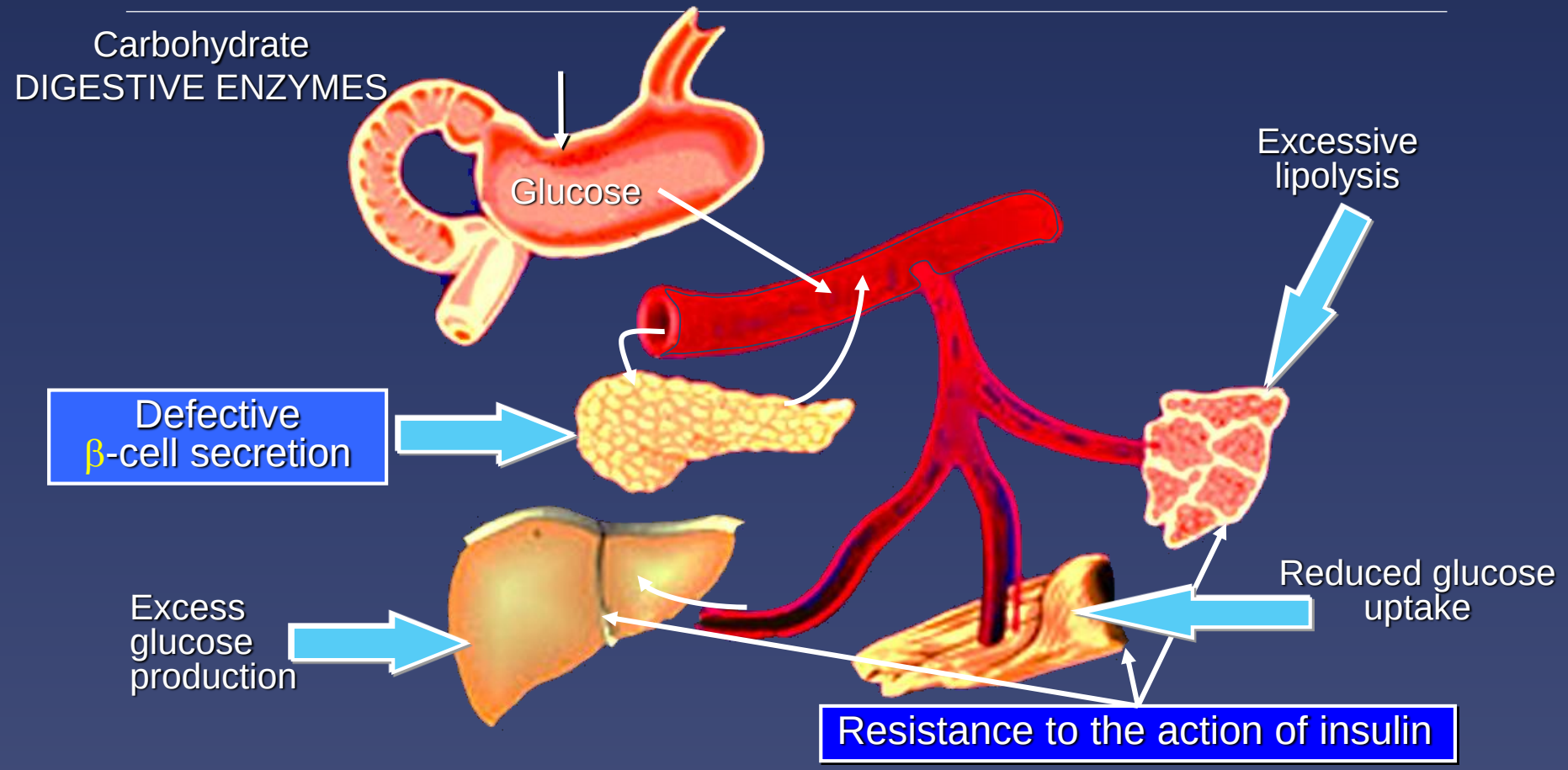


Pathophysiology of diabetic ketoacidosis

Latent Autoimmune Diabetes of Adults

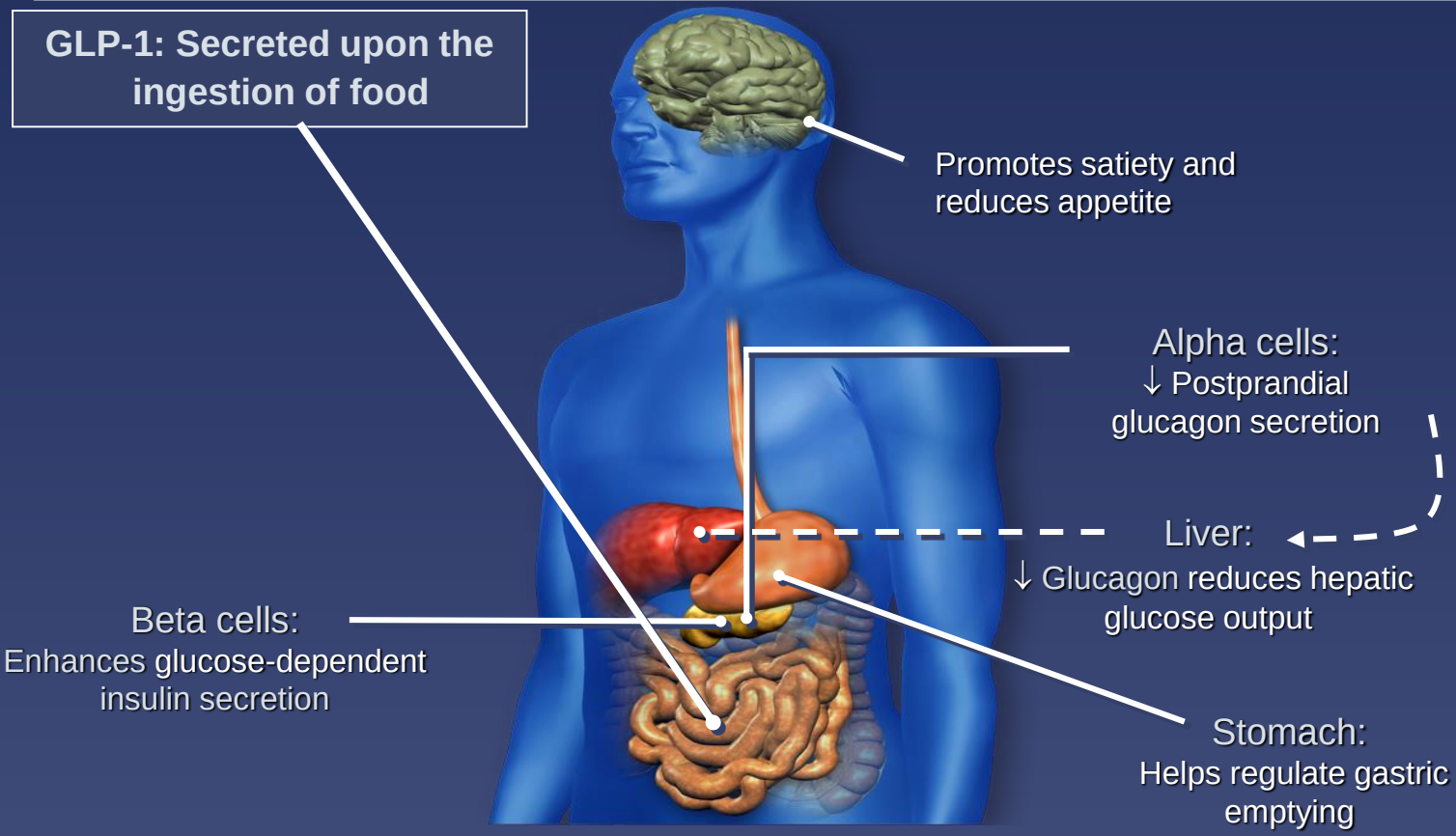
- **Form of Autoimmune (Type 1 DM)** The presence of autoantibodies to pancreatic islet cell antigens is the element common to both type 1 diabetes and LADA
- **Alternate terms:** Type 1.5 or Slow Onset Type 1
- Patients often mistakenly thought to have Type 2 based on time of diagnosis
- **Slowly progressive** form of autoimmune diabetes mellitus characterized by older age at diagnosis, the presence of pancreatic autoantibodies, and the lack of an absolute insulin requirement at diagnosis.
- Although patients with LADA present with more preserved beta cell function than those with classic type 1 diabetes, they tend to have a **rapid and progressive loss of beta cell function necessitating intensive insulin intervention**
- **Rapidly unresponsive to oral medications and parenteral agents, such as incretin mimetics.**

Pathophysiology of Type 2 Diabetes



Dinneen SF. *Diabet Med*. 1997; 14 (Suppl 3): S19-24.

GLP-1 Modulates Numerous Functions in Humans



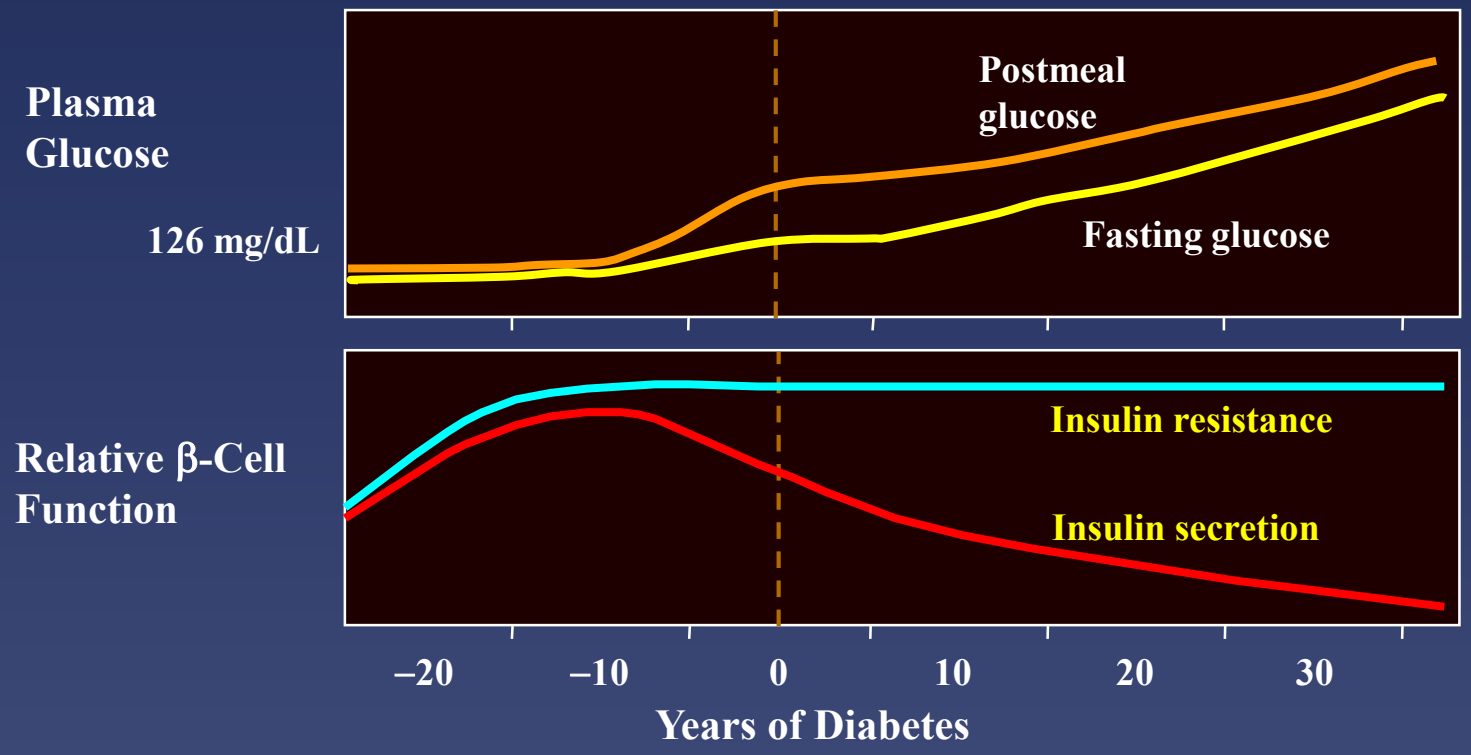
Data from Flint A, et al. *J Clin Invest*. 1998;101:515-520; Data from Larsson H, et al. *Acta Physiol Scand.* 1997;160:413-422
Data from Nauck MA, et al. *Diabetologia*. 1996;39:1546-1553; Data from Drucker DJ. *Diabetes*. 1998;47:159-169

Diabetes Response in Illness

- Infection causes a stress response in the body by increasing the amount of certain hormones such as cortisol and adrenaline.
- These hormones work against the action of insulin and, as a result, the body's production of glucose increases, which results in high blood sugar levels.
- When blood sugar is high, the white cells in are unable to respond to bacteria because they cannot move around at their normal speed and do not reach the infection site quickly enough to engulf and kill the bacteria.
- In a person who does not have diabetes, extra insulin is produced to counter these effects, but this is not possible for someone with diabetes, and so hyperglycemia persists

Illness and Diabetes. Diabetes Wellness Foundation. Retrieved from: https://www.diabeteswellness.net/sites/default/files/Illness%20and%20Diabetes.pdf

Natural History of Type 2 Diabetes



Adapted from International Diabetes Center (IDC). Minneapolis, Minnesota.

Categories of Glycemia

	Fasting (mg/dL)	2-Hour (mg/dL)	A1c
NORMAL	65-99	80-140	< 5.7%
IMPAIRED FASTING GLUCOSE	100-125		
IMPAIRED GLUCOSE TOLERANCE	141-199		5.7-6.4%
DIABETES	>126 (X 2)	>200	>6.5%

Pre-Diabetes

American Diabetes Association (ADA) Glycemic Recommendations for Nonpregnant Adults with Diabetes

A1C	<7.0%*
Preprandial capillary plasma glucose	80–130 mg/dL*
Peak postprandial capillary plasma glucose†	<180 mg/dL*

*Goals should be individualized.
†Postprandial glucose measurements should be made 1–2 h after the beginning of the meal, generally peak levels in patients with diabetes.

ADA. 6. Glycemic Targets. Diabetes Care 2015;38(suppl 1):S37; Table 6.2

Lifestyle Therapy

RISK STRATIFICATION FOR DIABETES COMPLICATIONS

INTENSITY STRATIFIED BY BURDEN OF OBESITY AND RELATED COMPLICATIONS

Nutrition	• Maintain optimal weight • Calorie restriction (if BMI is increased) • Plant-based diet; high polyunsaturated and monounsaturated fatty acids	• Avoid *trans* fatty acids; limit saturated fatty acids	• Structured counseling • Meal replacement
Physical Activity	• 150 min/week moderate exertion (eg. walking, stair climbing) • Strength training • Increase as tolerated	• Structured program • Wearable technologies	• Medical evaluation/ clearance • Medical supervision
Sleep	• About 7 hours per night • Basic sleep hygiene	• Screen OSA • Home sleep study	• Referral to sleep lab
Behavioral Support	• Community engagement • Alcohol moderation	• Discuss mood with HCP	• Formal behavioral therapy
Smoking Cessation	• No tobacco products	• Nicotine replacement therapy	• Referral to structured program

 DOI 10.4158/CS-2017-0153

Action Sites of Oral Diabetes Medication

DPP 4—Januvia, Onglyza

Sulfonylureas, Prandin, Starlix

Glucovance, Avandamet, Metaglip, ActosPlus Met

Pancreas

Glucophage

Liver

Welchol

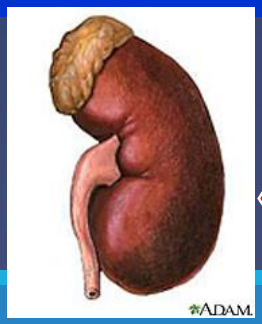
Muscle

Precose, Glyset

Avandia, Actos

Gut

Kidney



Invokana, Farxiga. Jardiance

Profiles of Antidiabetic Medications

	MET	GLP-1 RA	SGLT-2i	DPP-4i	AGi	TZD (moderate dose)	SU / GLN	COLSVL	BCR-QR	INSULIN	PRAML
HYPO	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Moderate/Severe / Mild	Neutral	Neutral	Moderate to Severe	Neutral
WEIGHT	Slight Loss	Loss	Loss	Neutral	Neutral	Gain	Gain	Neutral	Neutral	Gain	Loss
RENAL / GU	Contra-indicated if eGFR < 30 mL/min/1.73 m²	Exenatide Not Indicated CrCl < 30 Possible Benefit of Liraglutide	Not Indicated for eGFR < 45 mL/min/1.73 m² Genital Mycotic Infections Possible Benefit of Empagliflozin	Dose Adjustment Necessary (Except Linagliptin) Effective in Reducing Albuminuria	Neutral	Neutral	More Hypo Risk	Neutral	Neutral	More Hypo Risk	Neutral
GI Sx	Moderate	Moderate	Neutral	Neutral	Moderate	Neutral	Neutral	Mild	Moderate	Neutral	Moderate
CHF	Neutral	See #1	See #2	See #3	Neutral	Moderate	Neutral	Neutral	Neutral	CHF Risk	Neutral
CARDIAC											
ASCVD						May Reduce Stroke Risk	Possible ASCVD Risk	Benefit	Safe	Neutral	
BONE	Neutral	Neutral	Mild Fracture Risk	Neutral	Neutral	Moderate Fracture Risk	Neutral	Neutral	Neutral	Neutral	Neutral
KETOACIDOSIS	Neutral	Neutral	DKA Can Occur in Various Stress Settings	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral

Few adverse events or possible benefits

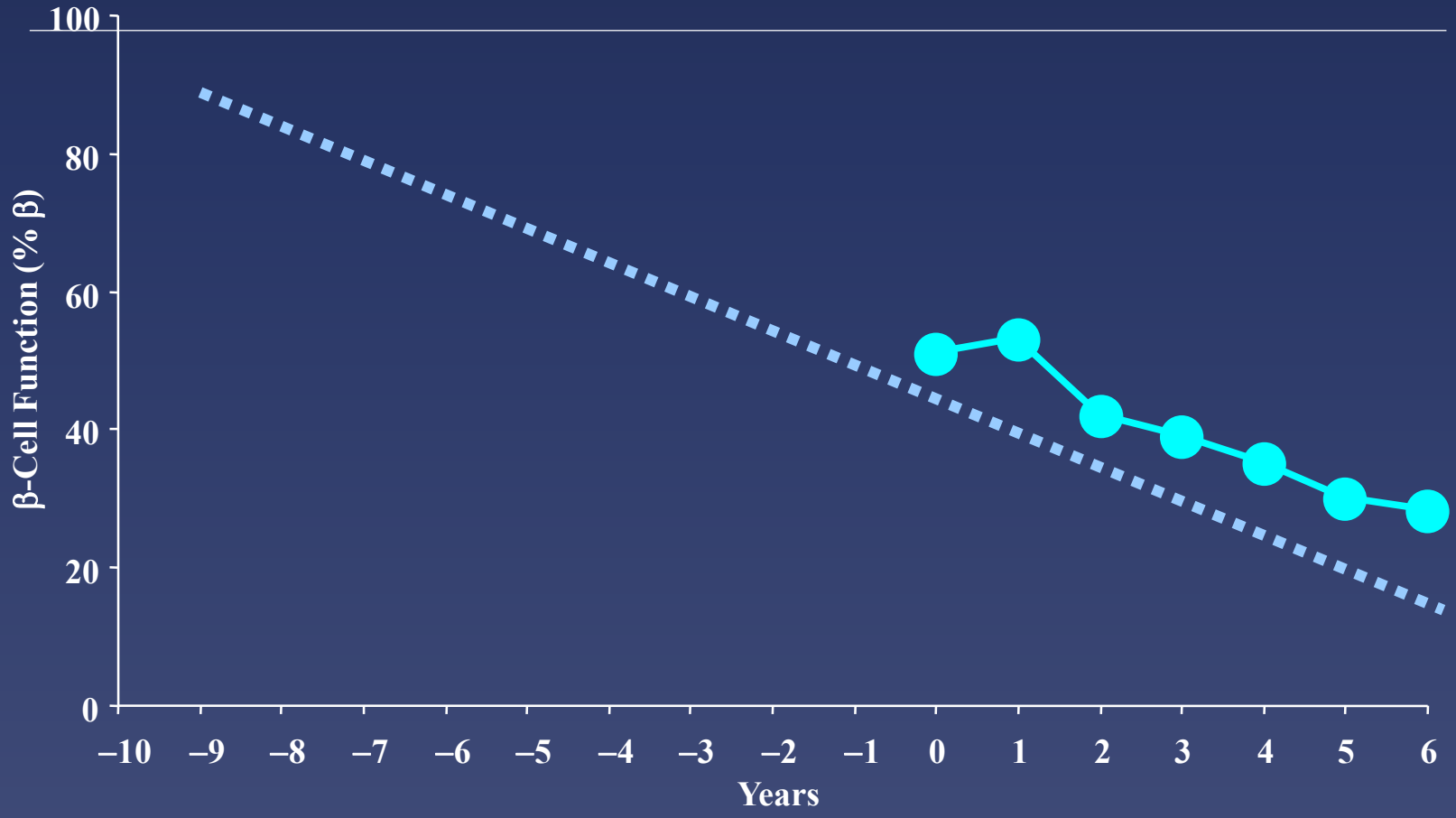
Likelihood of adverse effects

Use with caution

1. Liraglutide—FDA approved for prevention of MACE events.
2. Empagliflozin—FDA approved to reduce CV mortality. Canagliflozin shown to reduce MACE events.
3. Possible increased hospitalizations for heart failure with alogliptin and saxagliptin.

 DOI 10.4158/CS-2017-0153

Progressive Decline of β-Cell Function in the UKPDS



Adapted from UK Prospective Diabetes Study (UKPDS) Group. *Diabetes*. 1995; 44:1249-1258.

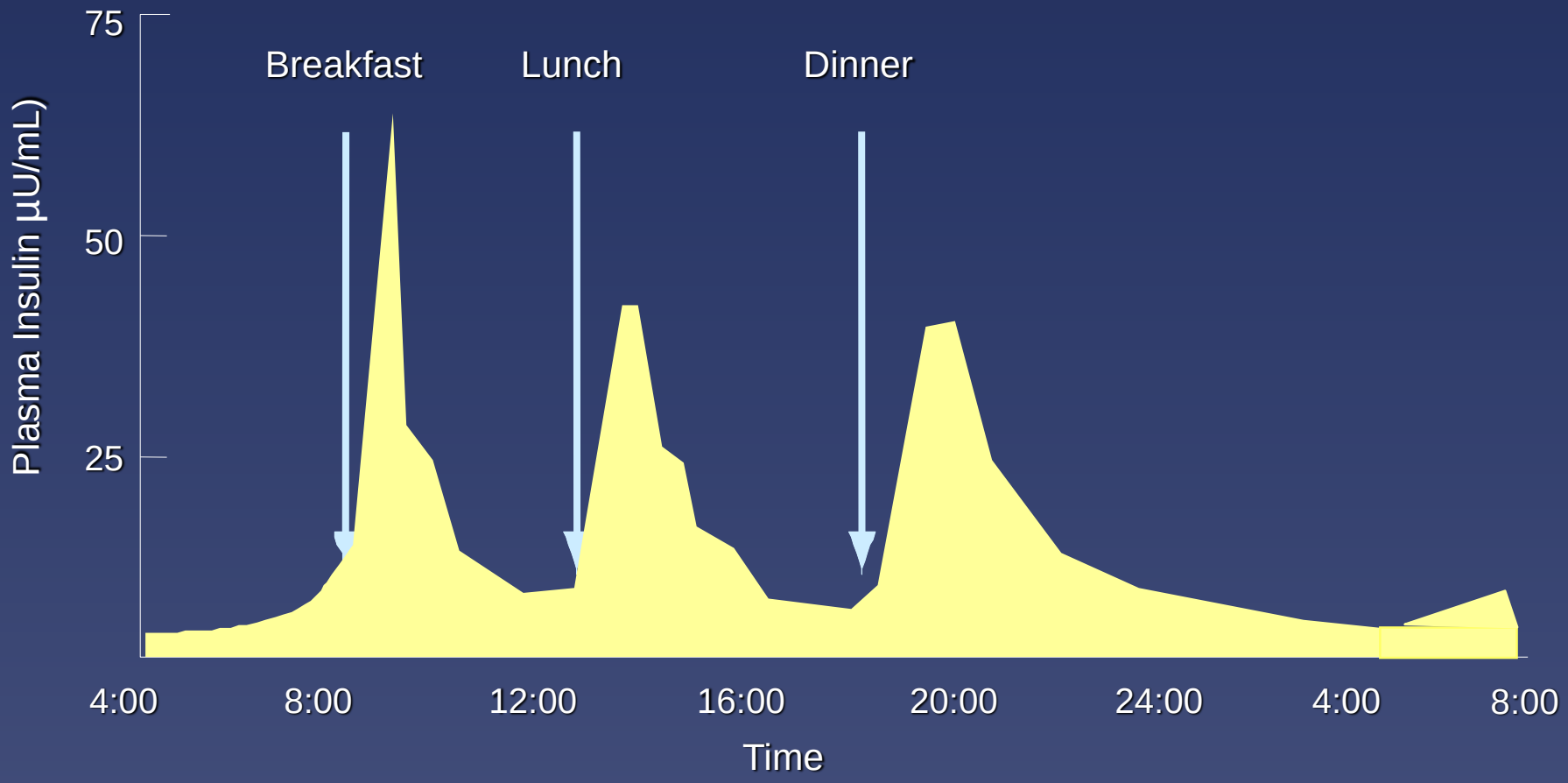
TYPE 2 DIABETES . . . A PROGRESSIVE DISEASE

Over time,
most patients will need
insulin
to control glucose

Mimicking Nature

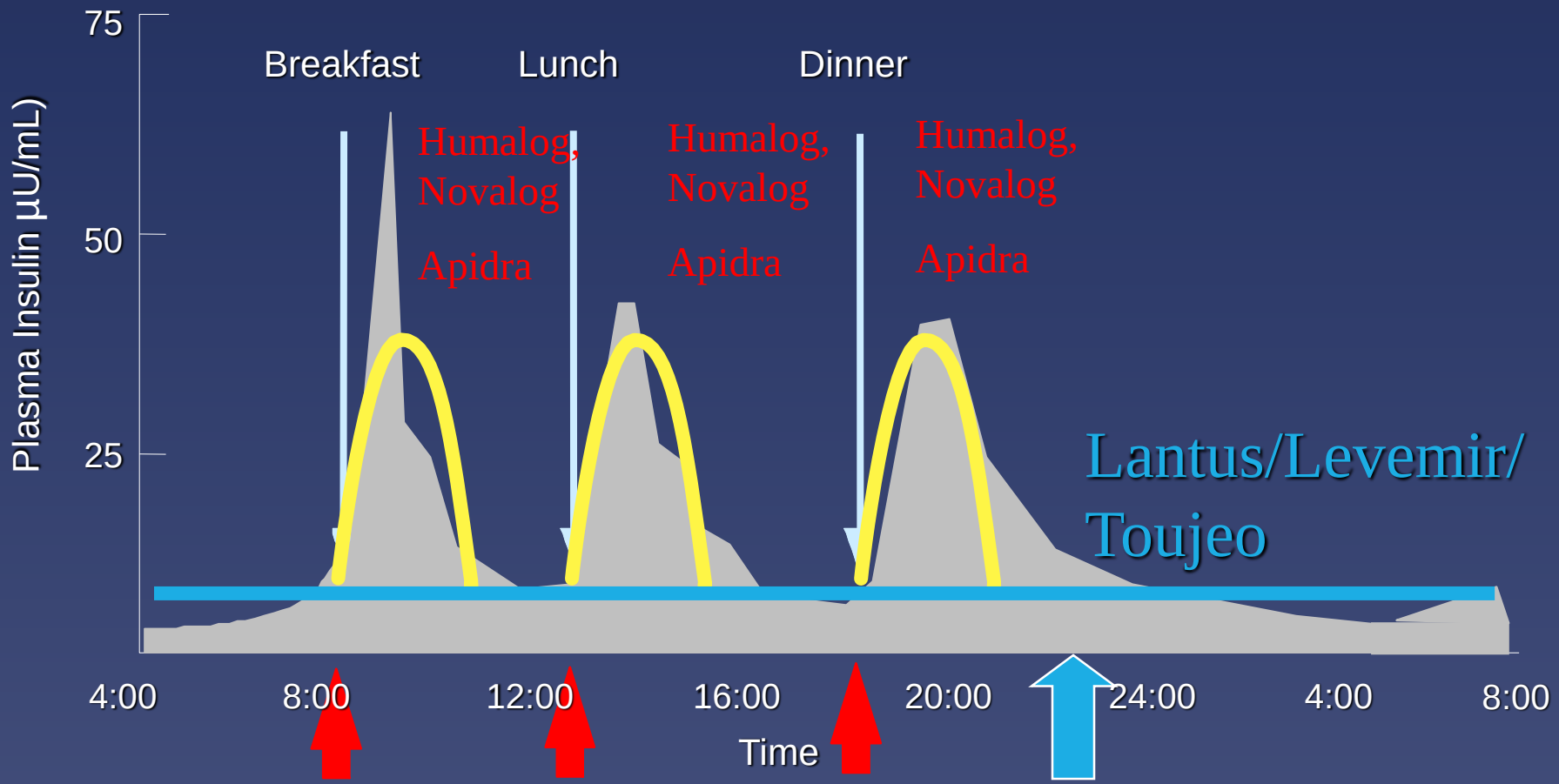
The Basal/Bolus Insulin Concept

Physiological Serum Insulin Secretion Profile



Combining Rapid Acting and Basal Insulin

Basal/Bolus Insulin



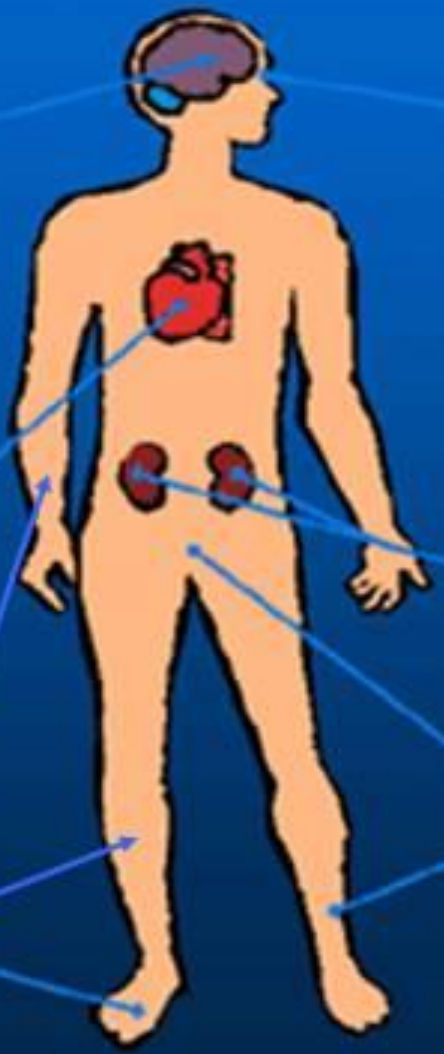
Complications of Diabetes

Macrovascular

Brain
Cerebrovascular Disease
- Transient ischemic attack
- Cerebrovascular accident
- Cognitive impairment

Heart
Coronary Artery Disease
- Coronary syndrome
- Myocardial infarction
- Congestive heart failure

Extremities
Peripheral Vascular Disease
- Ulceration
- Gangrene
- Amputation



Microvascular

Eyes
- Retinopathy
- Cataracts
- Glaucoma
- Blindness

Kidneys
Nephropathy
- Microalbuminuria
- Gross albuminuria
- Kidney failure

Nerves
Neuropathy
- Peripheral
- Autonomic

ASCVD Risk Factor Modifications Algorithm

DYSLIPIDEMIA

LIFESTYLE THERAPY (Including Medically Assisted Weight Loss)

LIPID PANEL: Assess ASCVD Risk

STATIN THERAPY
If TG > 500 mg/dL, fibrates, Rx-grade omega-3 fatty acids, niacin

If statin-intolerant

- Try alternate statin, lower statin dose or frequency, or add nonstatin LDL-C- lowering therapies
- Repeat lipid panel; assess adequacy, tolerance of therapy
- Intensify therapies to attain goals according to risk levels

RISK LEVELS	HIGH	VERY HIGH	EXTREME
	DESIRABLE LEVELS	DESIRABLE LEVELS	DESIRABLE LEVELS
LDL-C (mg/dL)	<100	<70	<55
Non-HDL-C (mg/dL)	<130	<100	<80
TG (mg/dL)	<150	<150	<150
Apo B (mg/dL)	<90	<80	<70

RISK LEVELS:
- **HIGH:** DM but no other major risk and/or age <40
- **VERY HIGH:** DM + major ASCVD risk(s) (HTN, Fam Hx, low HDL-C, smoking, CKD3,4)*
- **EXTREME:** DM plus established clinical CVD

If not at desirable levels: Intensify lifestyle therapy (weight loss, physical activity, dietary changes) and glycemic control; consider additional therapy

To lower LDL-C:	Intensify statin, add ezetimibe, PCSK9i, colesevelam, or niacin
To lower Non-HDL-C, TG:	Intensify statin and/or add Rx-grade OM3 fatty acid, fibrate, and/or niacin
To lower Apo B, LDL-P:	Intensify statin and/or add ezetimibe, PCSK9i, colesevelam, and/or niacin
To lower LDL-C in FH:**	Statin + PCSK9i

Assess adequacy & tolerance of therapy with focused laboratory evaluations and patient follow-up

HYPERTENSION

GOAL: SYSTOLIC <130, DIASTOLIC <80 mm Hg

ACEi or ARB

For initial blood pressure >150/100 mm Hg:
DUAL THERAPY

ACEi or ARB + Calcium Channel Blocker ✓ / ß-blocker ✓ / Thiazide ✓

If not at goal (2–3 months)

Add calcium channel blocker, ß-blocker or thiazide diuretic

If not at goal (2–3 months)

Add next agent from the above group, repeat

If not at goal (2–3 months)

Additional choices (α-blockers, central agents, vasodilators, aldosterone antagonist)

Achievement of target blood pressure is critical

* EVEN MORE INTENSIVE THERAPY MIGHT BE WARRANTED ** FAMILIAL HYPERCHOLESTEROLEMIA

 DOI 10.4158/CS-2017-0153

Case Study- Type 2 DM Transition of Care

Dan is a 66 y/o male, DX with Diabetes 7 years ago. His BMI is 32, A1c has been 6.8%. He is a former smoker with 20 pack years of smoking before he quit 2 years ago. He is discharged today after an acute episode of pneumonia and bronchitis and meds at home include antibiotics and tapering oral Prednisone. Before admission his med list included: Metformin 1000 mg bid, Januvia 100 mg daily, Lisinopril 10 mg daily, Simvastatin 40 mg daily. He received Novolog Insulin sub-q while in the hospital when his blood sugars were running consistently over 200. He is being discharged on his prior meds plus Novolog insulin, medium sliding scale, per insulin pen.

What is the reason for Dan's high blood sugars while in the hospital?

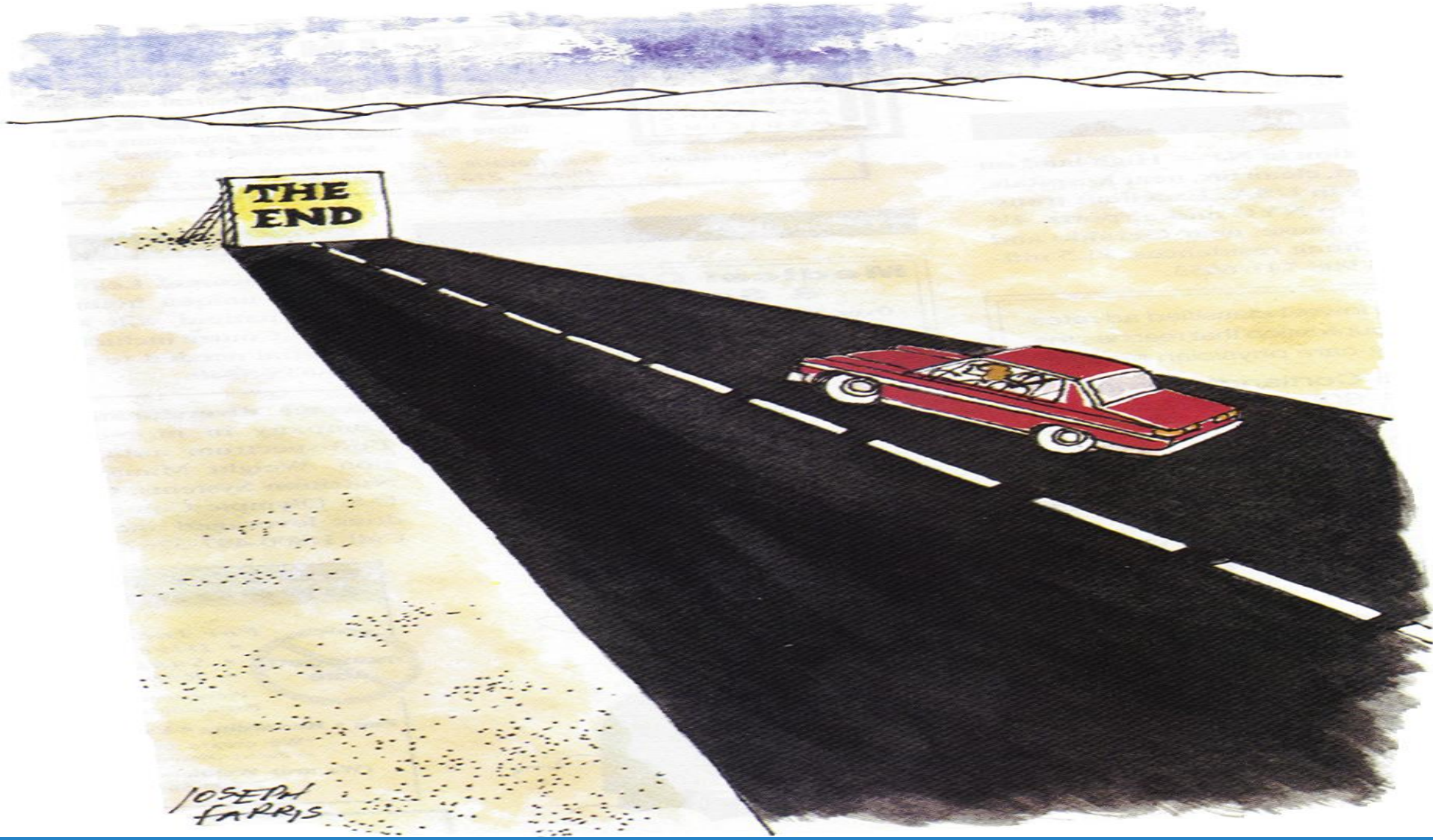
What do you as care coordinator, need to provide on his discharge?

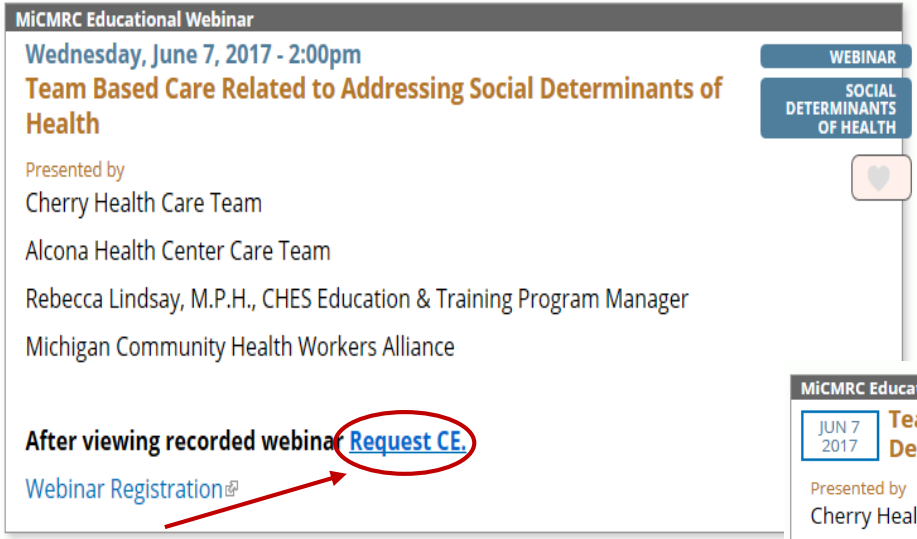
What is the rationale for insulin upon his discharge, when he was in good control prior?

Case Study Questions

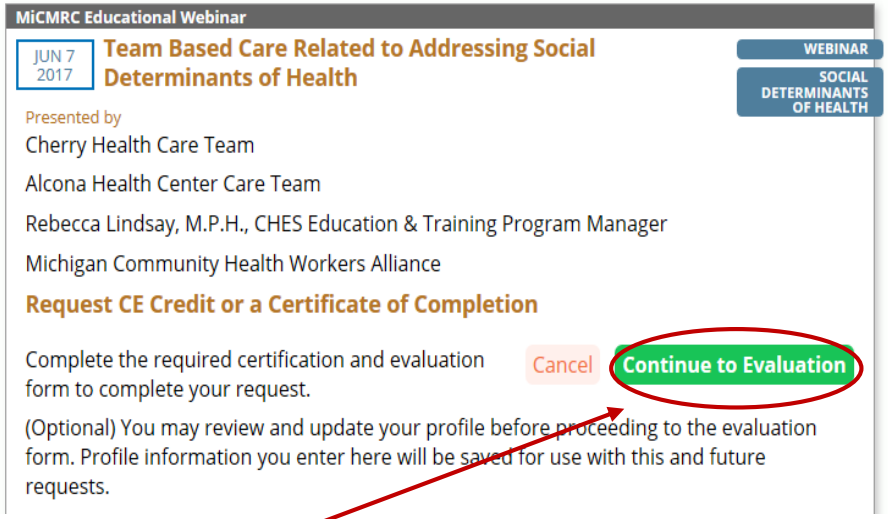
- What is the reason for Dan's high blood sugars while in the hospital?
- What do you as care coordinator, need to provide on his discharge?
- What is the rationale for insulin upon his discharge, when he was in good control prior?

DRAWING TO A CLOSE





Click link shown to start CE process



Click on evaluation link to complete CE process