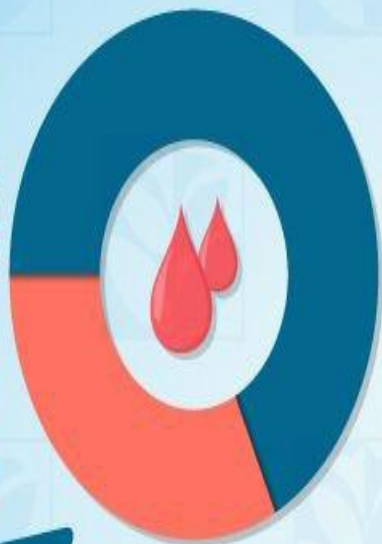


DIABETES

3.7 MILLION

DEATHS DUE TO DIABETES
AND HIGH BLOOD GLUCOSE

1.5 MILLION
DEATHS CAUSED
BY DIABETES



**DIABETES IS
ON THE RISE**

2015
one in **11** adults
has diabetes

2040
one in **10** adults
will have diabetes

388 MILLION
ADULTS HAVE DIABETES



**THE GLOBAL PREVALENCE OF DIABETES AMONG ADULTS
OVER 18 YEARS OF AGE HAS RISEN FROM 4.7% IN 1980
TO 8.5% IN 2014**



VILLA MEDICA

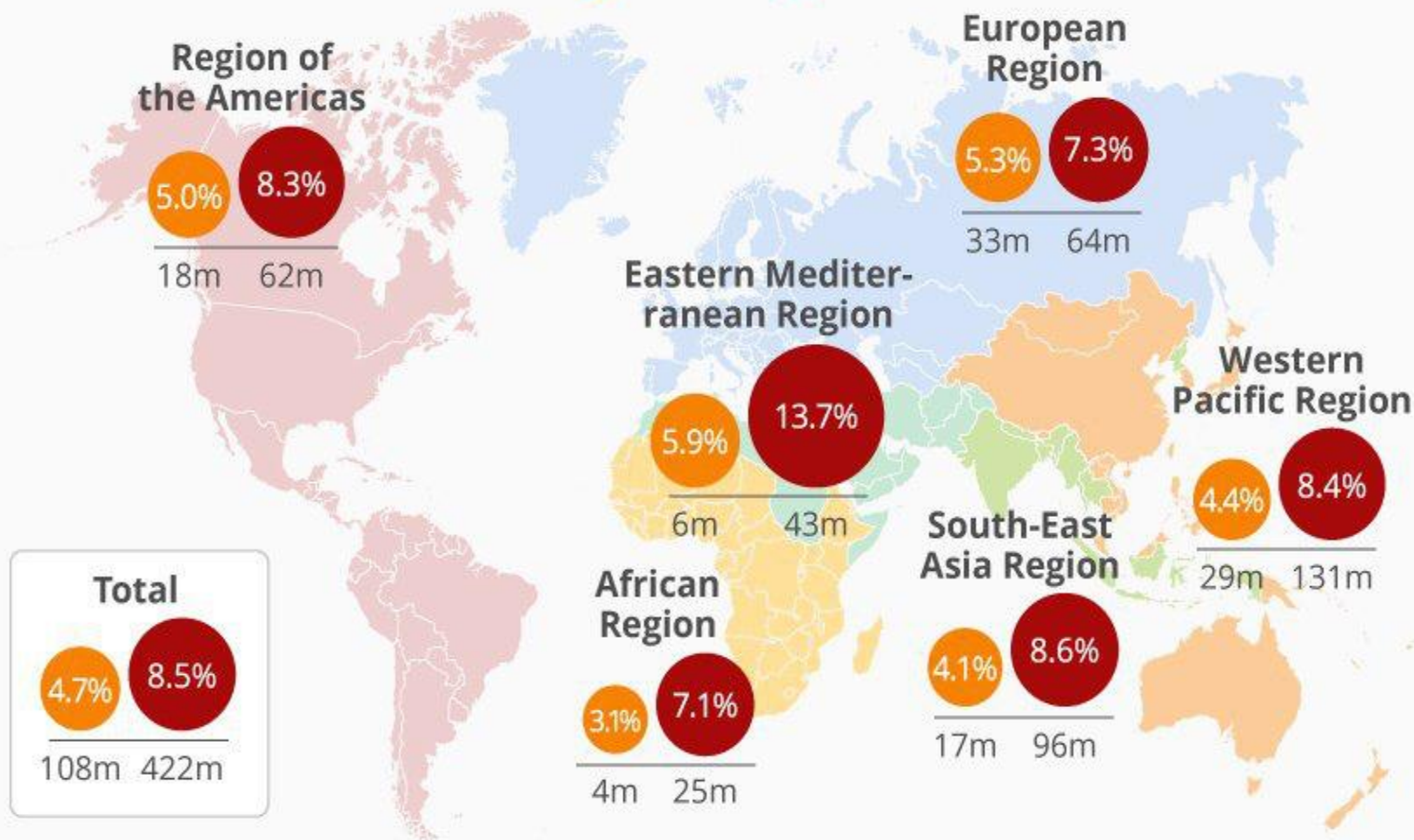
CLINIC FOR REGENERATIVE MEDICINE

GERMANY-SINCE 1978

The Unrelenting March Of Diabetes

% prevalence and number of adults with diabetes by WHO region in 1980 and 2014*

● 1980 ● 2014



LIVING WELL WITH DIABETES

Are you one of the **30.3 million** Americans with diabetes?

To be your healthiest and feel your best:



Eat more **fruits and vegetables**, less **sugar and salt**.



Get **physically active**—aim for at least 150 min/week.



Take **diabetes medicine** as prescribed.



Make and keep appointments with your health care team.



Check **blood sugar** regularly.



Know your ABCs:

- Regular **A1C** test
- **B**lood pressure below 140/90 mm Hg
- Control **cholesterol**
- Stop/don't start **smoking**

DID YOU KNOW... making healthy lifestyle changes can greatly reduce your risk of diabetes-related health problems. **It really works!**

INSULIN

Insulin aspart **NOVOLOG**

Insulin detemir LEVEMIR

Insulin glargine **LANTUS**

Insulin glulisine APIDRA

Insulin lispro **HUMALOG**

NPH insulin suspension **HUMULIN N, NOVOLIN N**

Regular insulin **HUMULIN R, NOVOLIN R**

AMYLIN ANALOG

Pramlintide SYMLIN

ORAL AGENTS

Acarbose **PRECOSE**

Alogliptin NESINA

Bromocriptine CYCLOSET

Canagliflozin INVOKANA

Colesevelam WELCHOL

Dapagliflozin FARXIGA

Glimepiride AMARYL

Glipizide **GLUCOTROL**

Glyburide DIABETA, GLYNASE PRESTAB

Linagliptin TRADJENTA

Metformin **FORTAMET, GLUCOPHAGE**

Miglitol GLYSET

Nateglinide STARLIX

Pioglitazone ACTOS

Repaglinide PRANDIN

Rosiglitazone **AVANDIA**

Saxagliptin ONGLYZA

Sitagliptin JANUVIA

Tolbutamide TOLBUTAMIDE

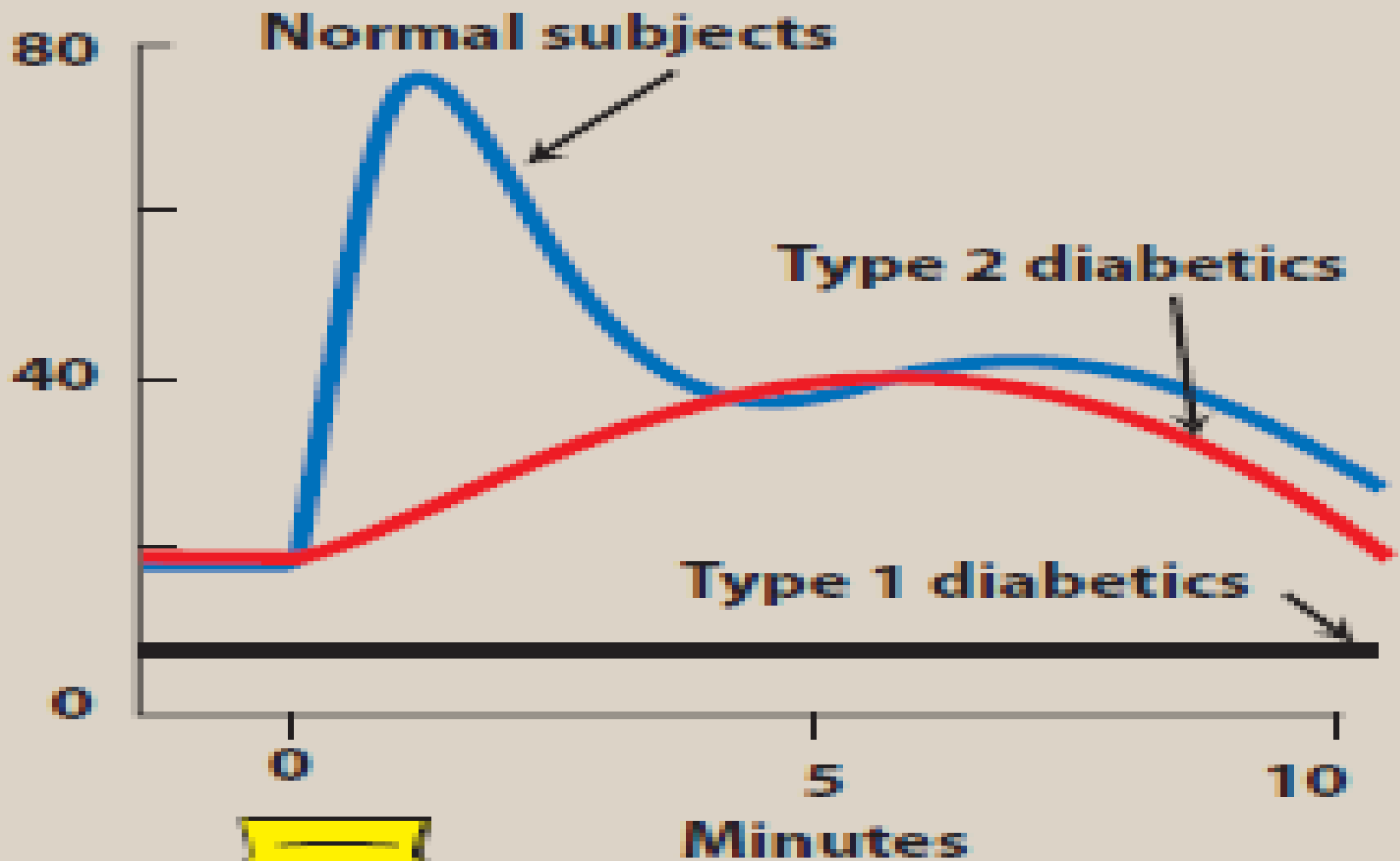
INCRETIN MIMETIC

Exenatide **BYETTA, BYDUREON**

Liraglutide VICTOZA

	Type 1	Type 2
Age of onset	Usually during childhood or puberty	Commonly over age 35
Nutritional status at time of onset	Commonly undernourished	Obesity usually present
Prevalence	5% to 10% of diagnosed diabetics	90% to 95% of diagnosed diabetics
Genetic predisposition	Moderate	Very strong
Defect or deficiency	β cells are destroyed, eliminating the production of insulin	Inability of β cells to produce appropriate quantities of insulin; insulin resistance; other defects

Plasma concentration of insulin ($\mu\text{U}/\text{mL}$)



Normal subjects

Type 2 diabetics

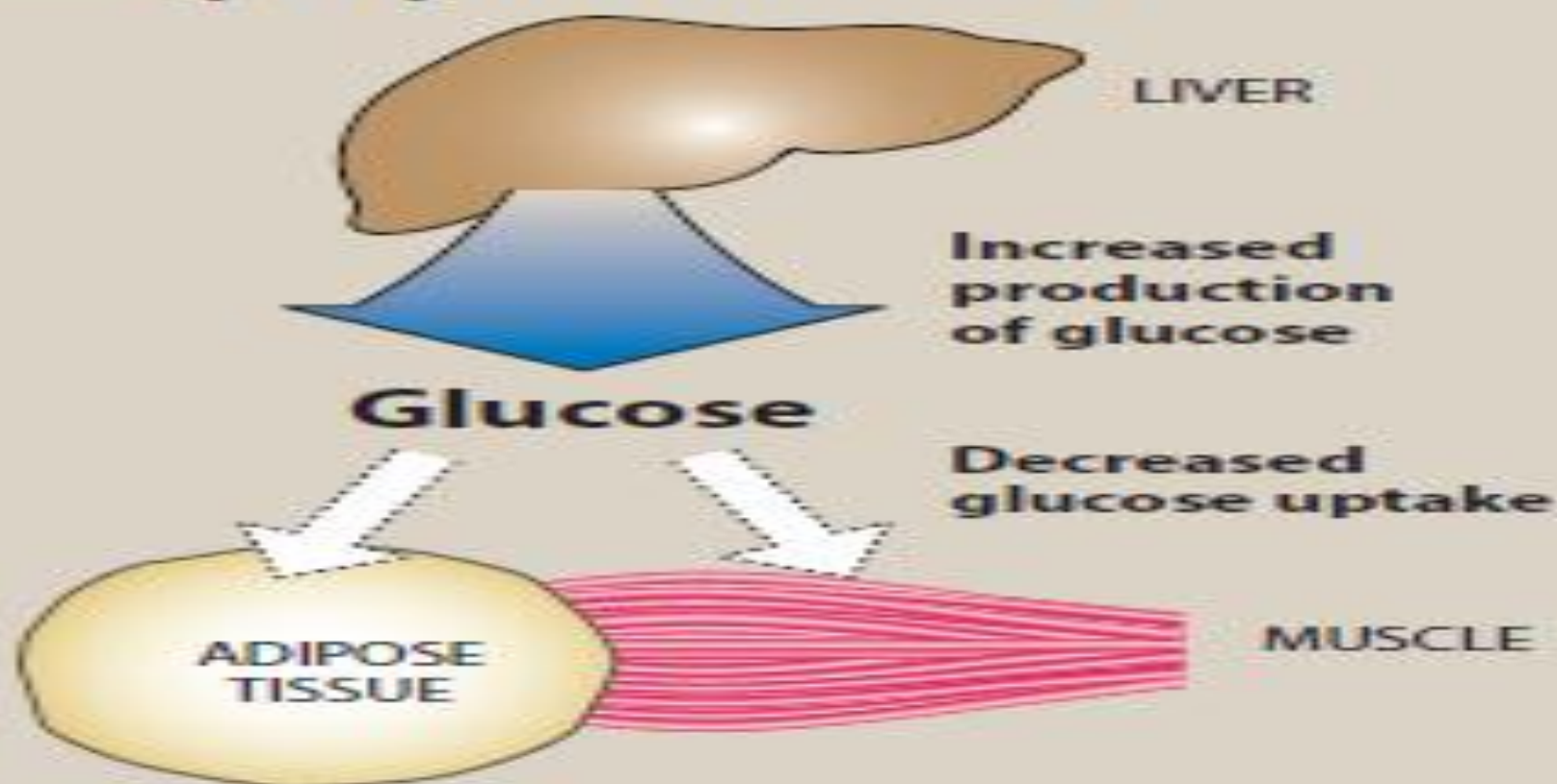
Type 1 diabetics

Minutes



Infusion of glucose

1 *Insulin resistance in peripheral tissues*



2 *Inadequate insulin secretion from β cells*



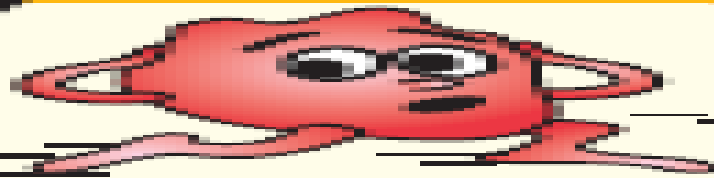
**Symptoms caused
by hypoglycemia**



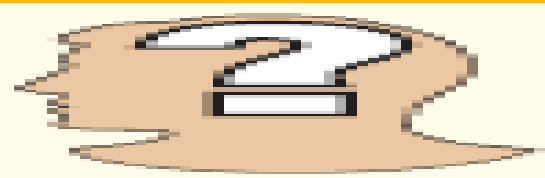
Headache



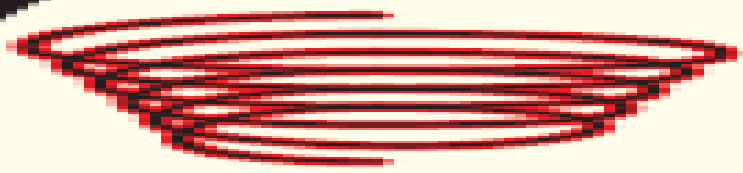
Anxiety



Tachycardia



Confusion



Vertigo



Diaphoresis



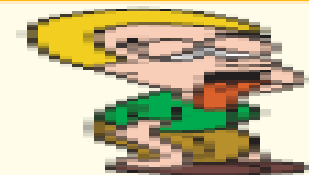
Shaky



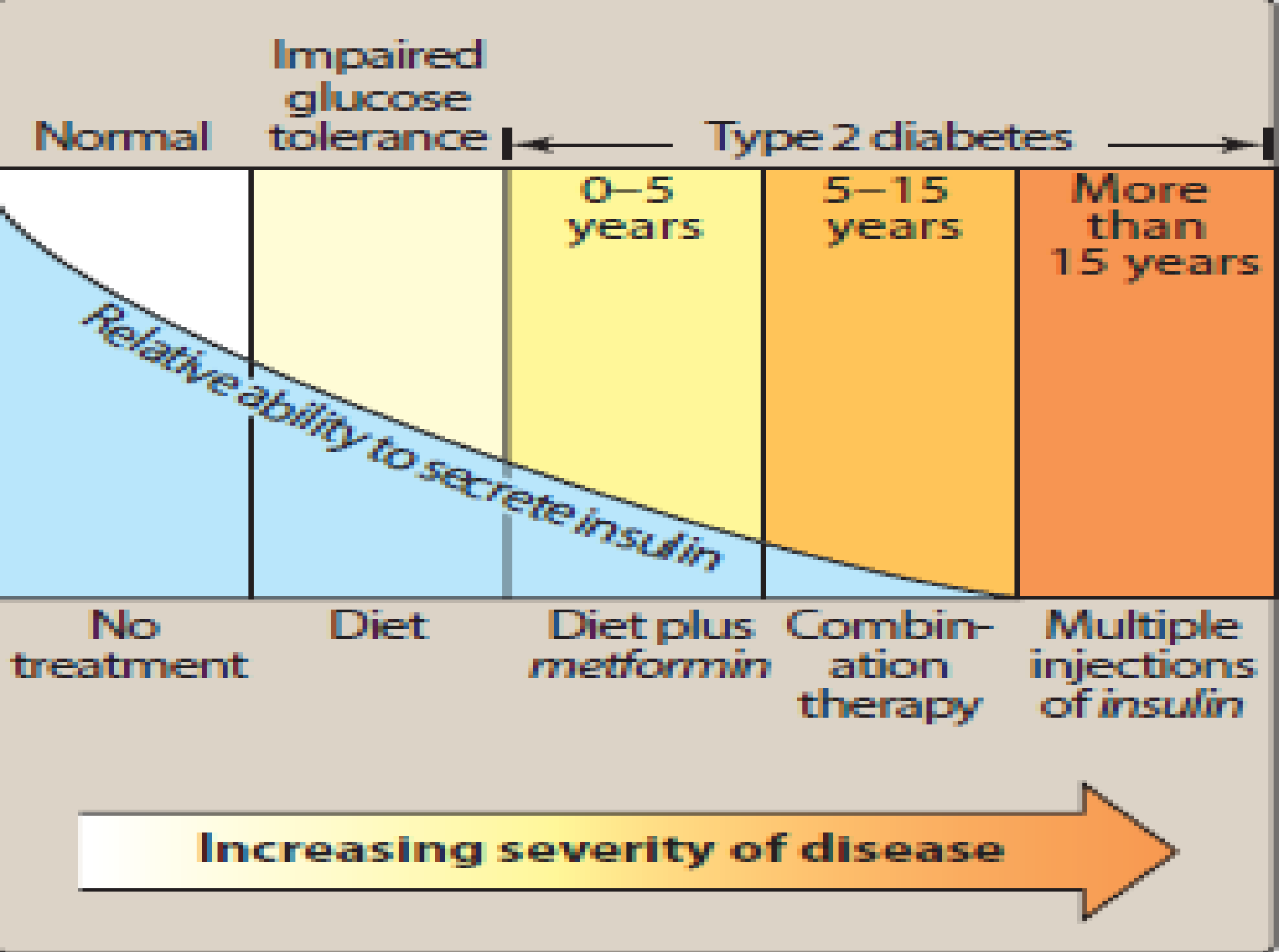
**Increased
appetite**

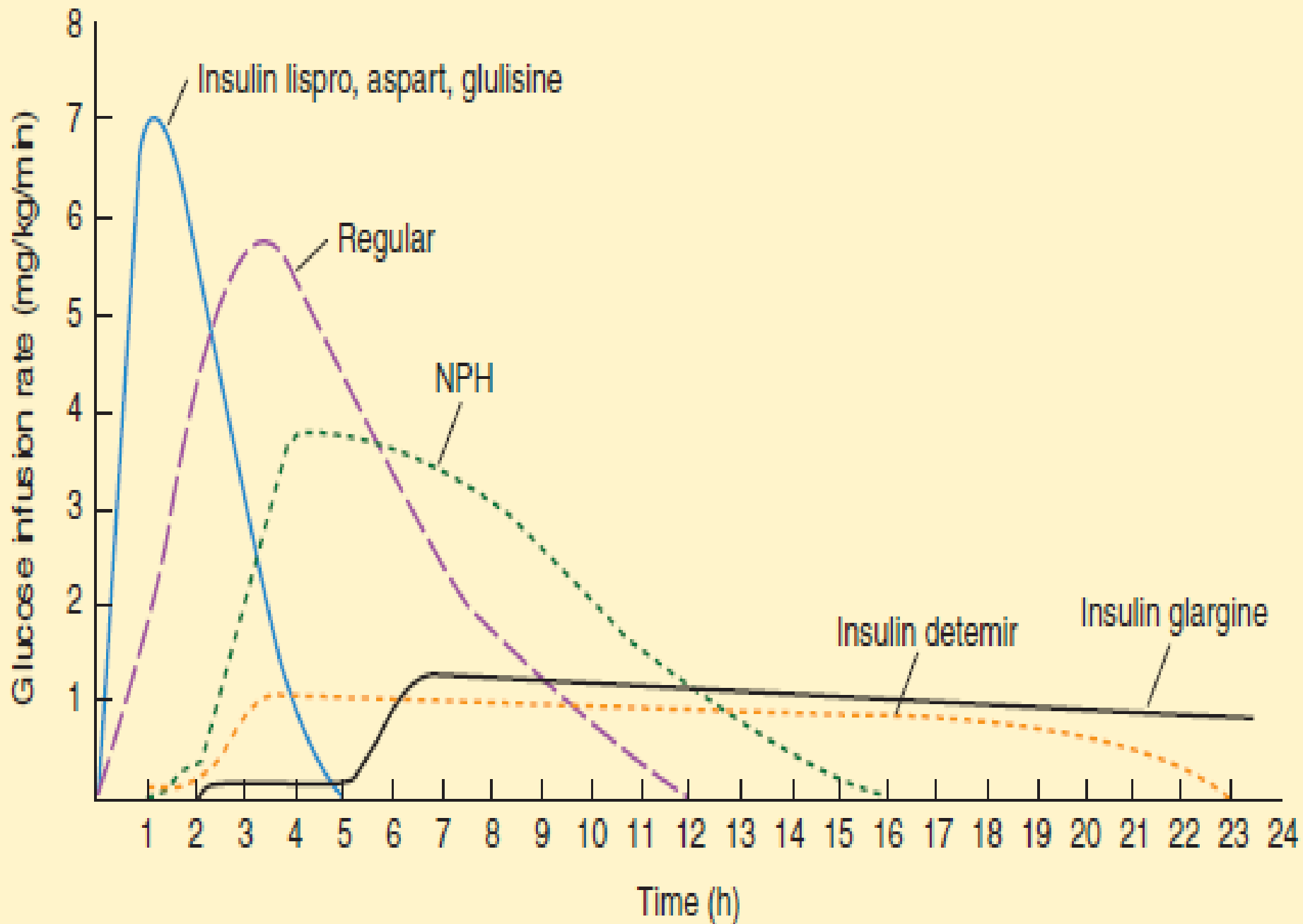


Blurred vision

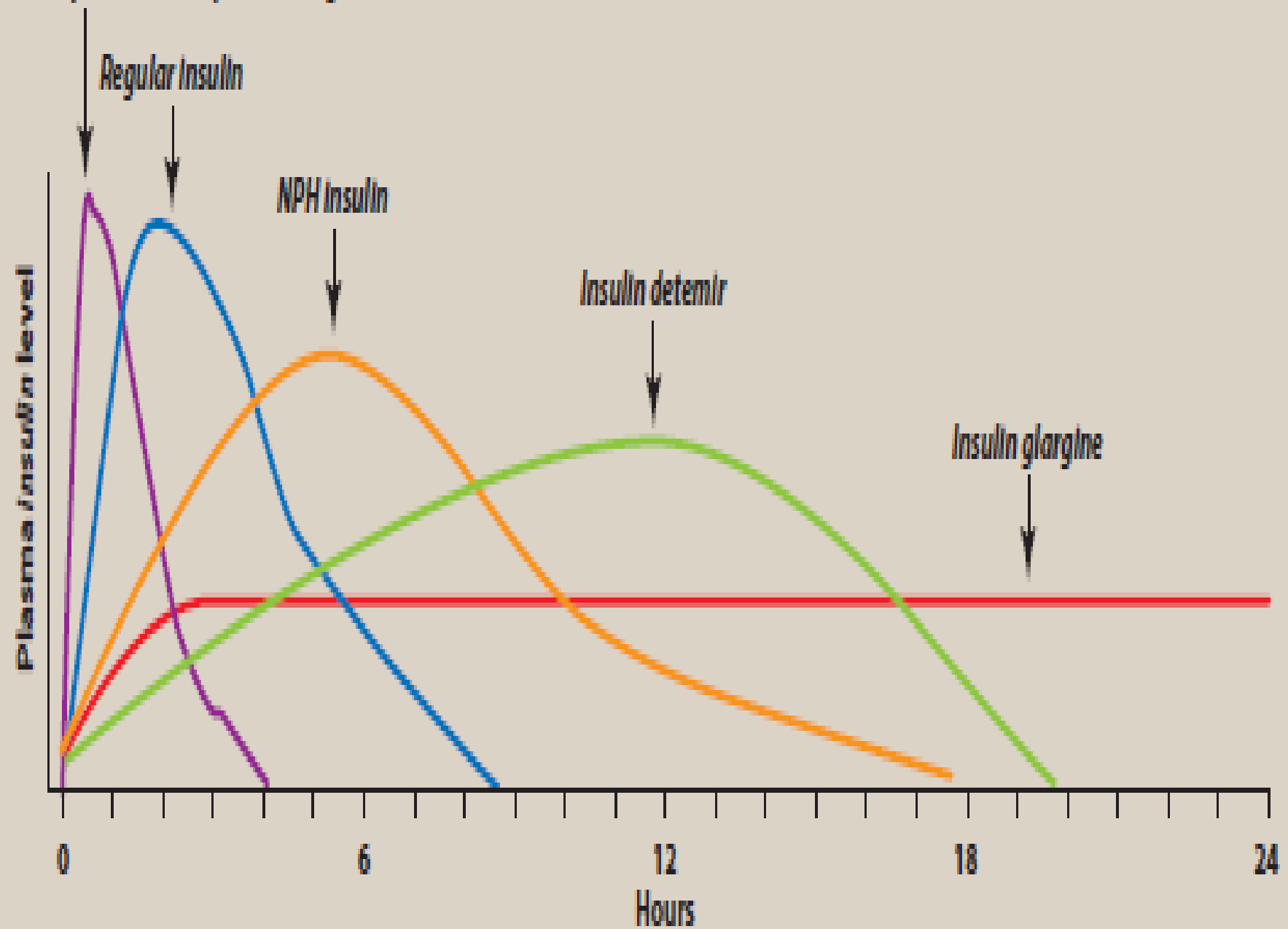


**Weakness/
fatigue**





Insulin aspart, insulin lispro, insulin glulisine





LANTUS®



DIN 02245400

Lantus®

insulin glargine injection
(rDNA origin)
insuline glargine injectable
(ADN recombiné)

100 U/mL

insulin solution - SC injection



Lantus® SoloStar®

insulin glargine (rDNA origin) injection

100 units/mL (U-100) Rx ONLY

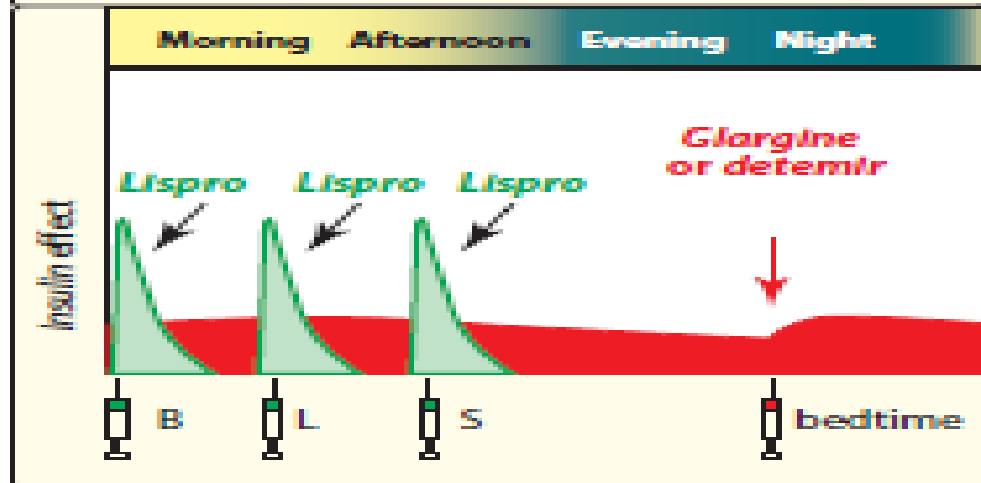
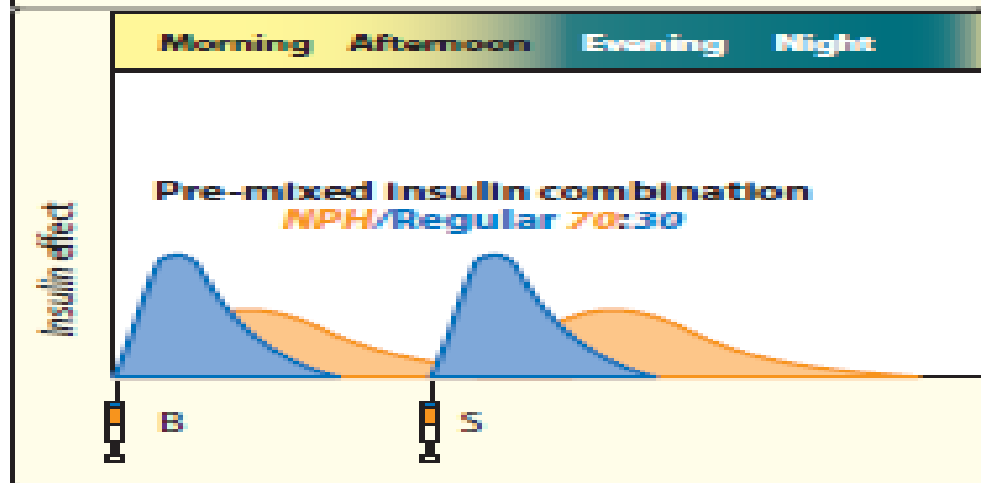
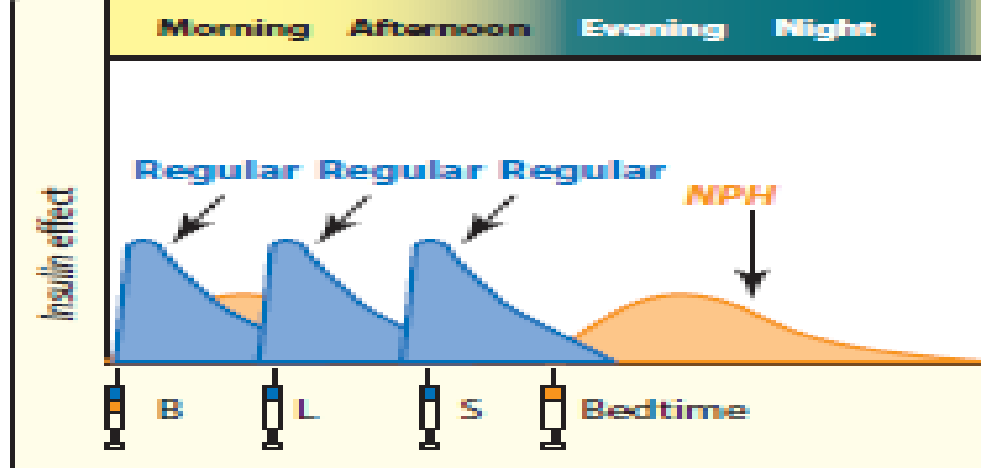
0
10
20



A blue NovoMix 30 FlexPen insulin pen is shown horizontally against a white background. The pen has a black dial on the right side with a white window showing the number '0'. The text 'NovoMix 30' and 'FlexPen' is printed in white on the blue body. The pen is capped with a black rubber stopper.

NovoMix[®] 30
FlexPen[®]

0
1
2



Glyburide 18 h

Gliptizide 20 h

Glimepiride 24 h

Nateglinide 2 h

Repaglinide 2 h

Metformin 6 h

Pioglitazone >24 h

Acarbose 6 h

Miglitol 6 h

DRUG CLASS	MECHANISM OF ACTION	EFFECT ON PLASMA INSULIN	RISK OF HYPOGLYCEMIA	COMMENTS
Sulfonylureas <i>Glimepiride</i> <i>Glipizide</i> <i>Glyburide</i>	Stimulates insulin secretion	↑	Yes	Well-established history of effectiveness. Weight gain can occur. Hypoglycemia most common with this class of oral agents.
Glinides <i>Nateglinide</i> <i>Repaglinide</i>	Stimulates insulin secretion	↑	Yes (rarely)	Taken with meals. Short action with less hypoglycemia. Postprandial effect.
Biguanides <i>Metformin</i>	Decreases hepatic production of glucose	↓	No	Preferred agent for type 2 diabetes. Well-established history of effectiveness. Weight loss may occur. Monitor renal function.
Thiazolidinediones (glitazones) <i>Pioglitazone</i> <i>Rosiglitazone</i>	Binds to peroxisome proliferator-activated receptor- γ in muscle, fat and liver to decrease insulin resistance	⇓⇓	No	Effective in highly insulin-resistant patients. Once-daily dosing for <i>pioglitazone</i> . Check liver function before initiation. Avoid in liver disease or heart failure.
α-Glucosidase inhibitors <i>Acarbose</i> <i>Miglitol</i>	Decreases glucose absorption	↔	No	Taken with meals. Adverse gastrointestinal effects.
DPP-4 inhibitors <i>Alogliptin</i> <i>Linagliptin</i> <i>Sitagliptin</i> <i>Saxagliptin</i>	Increases glucose-dependent insulin release; decreases secretion of glucagon	↑	No	Once-daily dosing. May be taken with or without food. Well tolerated. Risk of pancreatitis.
Incretin mimetics <i>Exenatide</i> <i>Liraglutide</i>	Increases glucose-dependent insulin release; decreases secretion of glucagon; slows gastric emptying; increases satiety	↑	No	Injection formulation. <i>Exenatide</i> should be injected twice daily within 60 minutes prior to morning and evening meals. Extended-release <i>exenatide</i> is given once weekly. <i>Liraglutide</i> is dosed once-daily without regard to meals. Weight loss may occur. Risk of pancreatitis.
SGLT2 inhibitors <i>Canagliflozin</i> <i>Dapagliflozin</i>	Increases urinary glucose excretion	↔	No	Once-daily dosing in the morning. Risk of hypotension, hyperkalemia. Avoid in severe renal impairment.