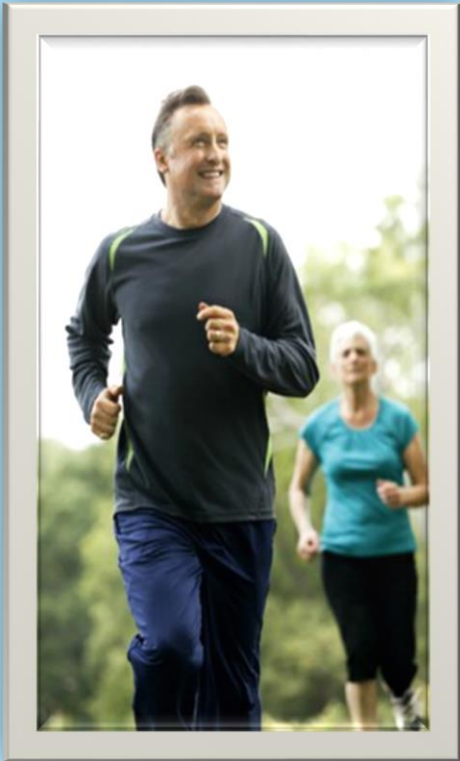


CDE Exam Preparation
Wendy Graham RD CDE
Mentor/Best Practice Facilitator
March 2019

WaterlooWellington
D I A B E T E S



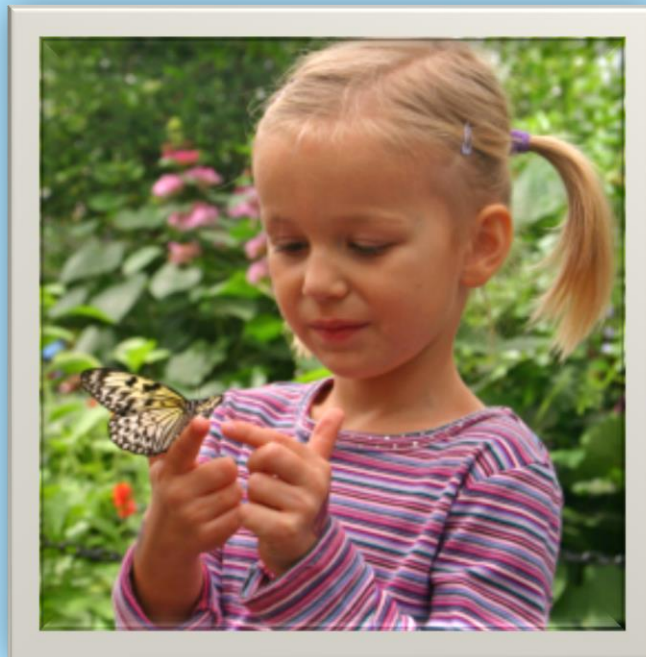


ADULTS



ADOLESCENTS

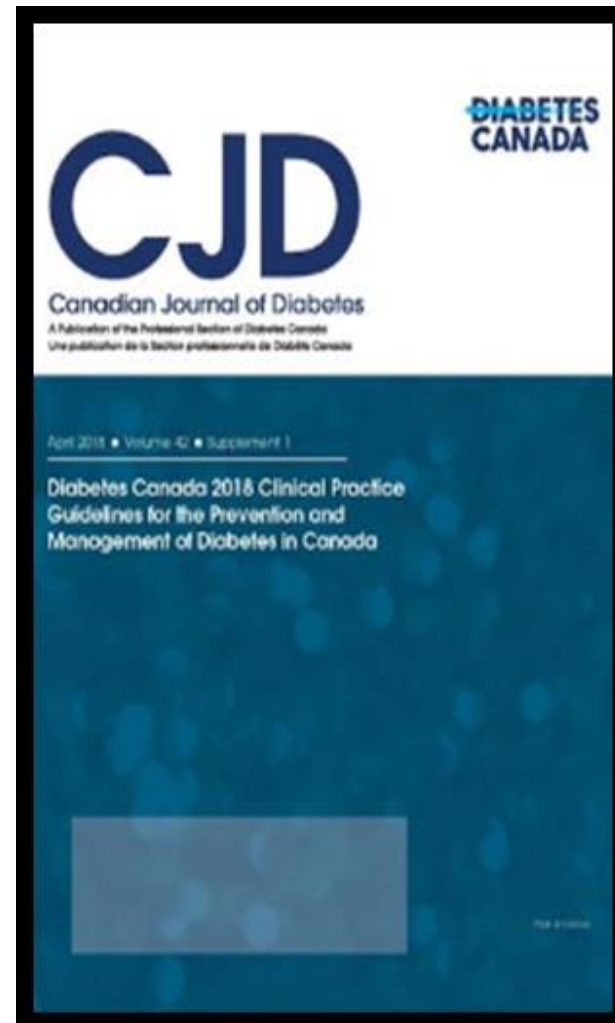
CHILDREN



OBJECTIVES

- Review the etiology, signs and symptoms and prevalence of type 1 diabetes
- Discuss insulin requirements
- Review various types of insulin
- Discuss the benefits of pump therapy
- Discuss the management of exercise
- Review the driving guidelines for diabetes
- Discuss hypoglycemia
- Discuss the challenges of treatment of type 1 diabetes in children and adolescents that differ from adults





Clinical Practice Guidelines 2018
CDE Competencies 2018

Guidelines.diabetes.ca



TYPE 1

Autoimmune disorder

Genetic predisposition

+

Environmental trigger

➔ **Causing destruction of β -cells**

- ❖ No insulin secretion
- ❖ Require exogenous insulin



TYPE 1

□ Onset

- Rapid
- Symptomatic
 - Sudden Weight loss
 - Polydipsia
 - Polyuria
 - Polyphagia
 - Blurred vision

□ Young and Lean

□ Ketosis prone



TYPE 1 PREDIAGNOSIS

Stage 1:

- Presences of two or more islet antibodies

Stage 2:

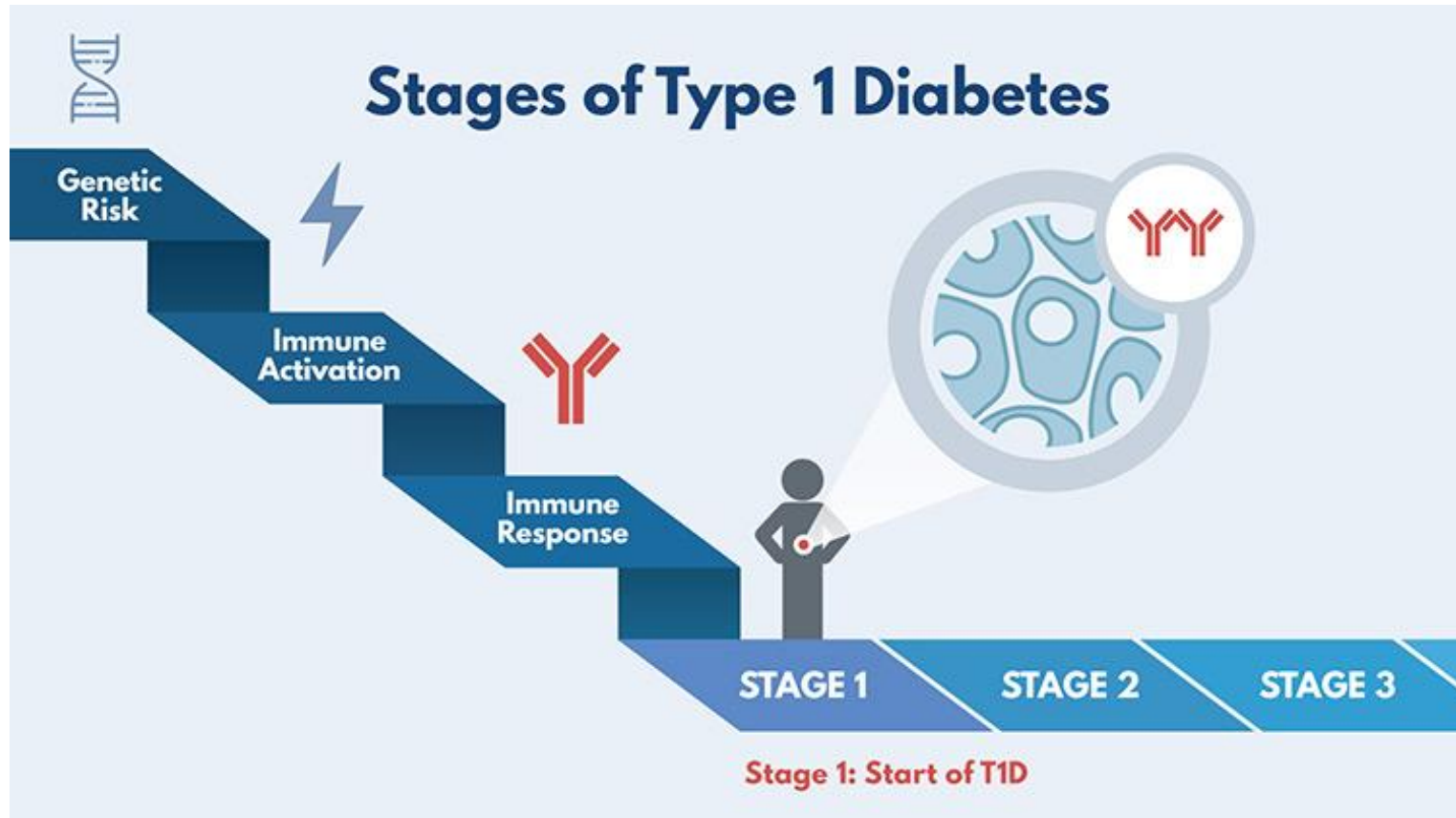
- Presences of β -cell autoimmunity
- Dysglycemia is presymptomatic

Stage 3

- Onset of the symptomatic disease
- Only 10% of β -cell remain



TYPE 1



Insel R et al. Staging Presymptomatic Type 1 Diabetes: A scientific Statement of JDRF, The Endocrine Society and the American Diabetes Association. Diabetes Care 2015;38:1964-1974.

PREVALENCE



2016 prevalence of diabetes was 9.3%



DIABETES

Type 1

- 10% of diabetes
- 25% of Type 1 are diagnosed as adults
- Parents, children and siblings of a person with type 1 have a **10 fold greater risk of developing diabetes**

Type 2

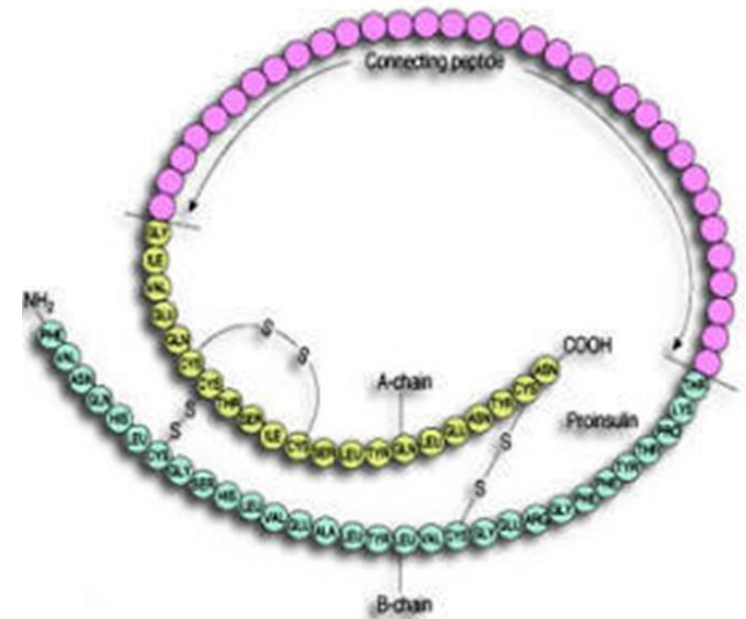
- 90 % of diabetes
- 10 - 20 % may be misdiagnosed LADA



DIABETES

Type 1

- GAD (glutamic acid decarboxylase)
- Ketones
- C-peptide



Proinsulin structure



DIABETES

LADA- Latent autoimmune diabetes in adults

- Autoimmune
- Presence of antibodies
 - GAD 65(glutamic acid decarboxylase)
- Diagnosis is difficult
- Slow destruction of Beta cells
- Older, lean
- Often started on oral agents
- Don't have high TG or low HDL
- Higher rate in underdeveloped countries



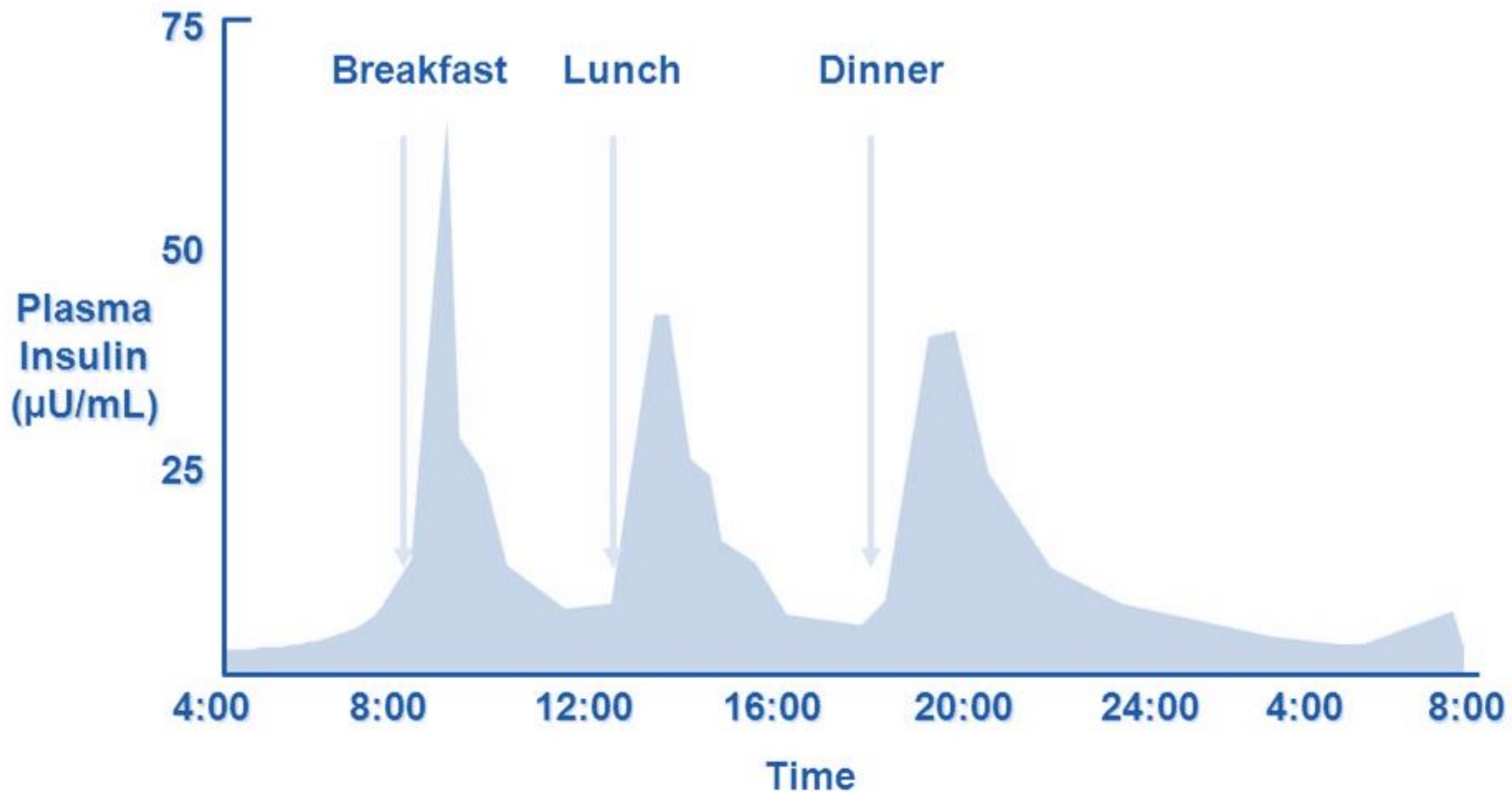
TYPE 1 TREATMENT



Blood Glucose control is always a
balance between
optimal blood glucose control
and the
risk of Hypoglycemia



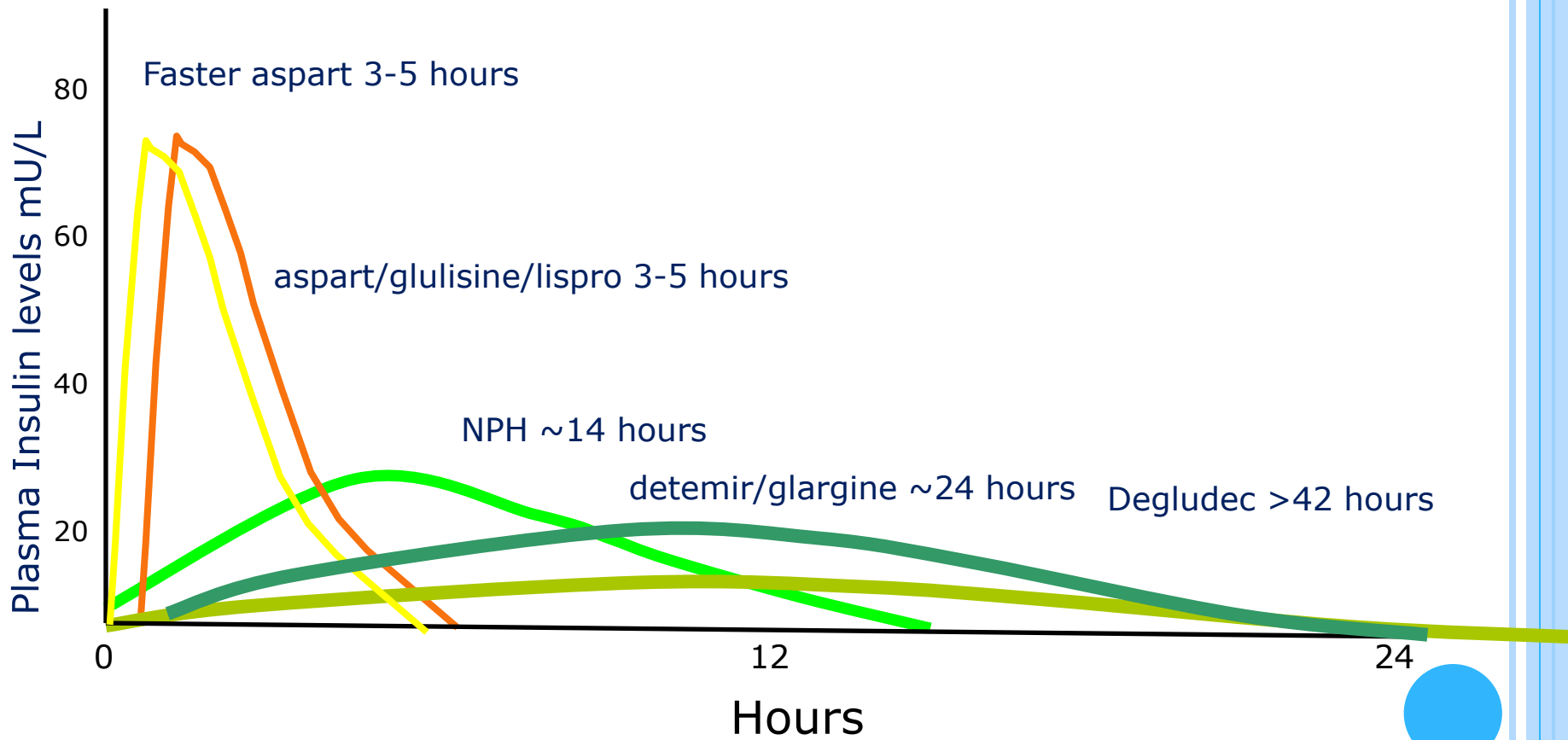
PHYSIOLOGIC INSULIN SECRETION



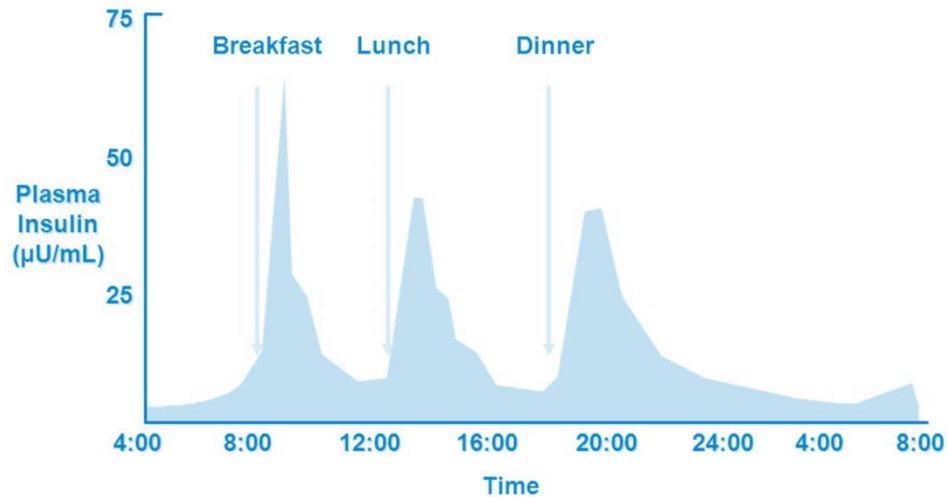
Adapted from White JR, Campbell RK, Hirsch I. Postgraduate Medicine. June 2003;113(6):30-36.



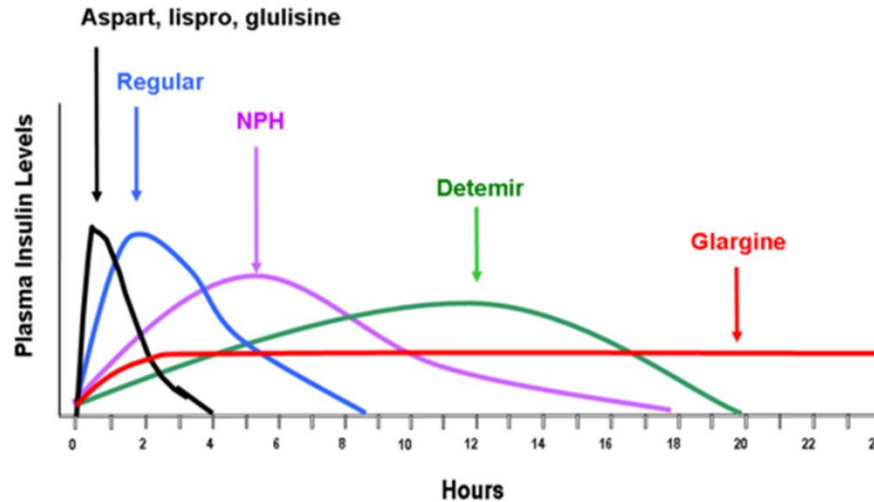
TYPES OF INSULIN



Physiologic versus Insulin injections

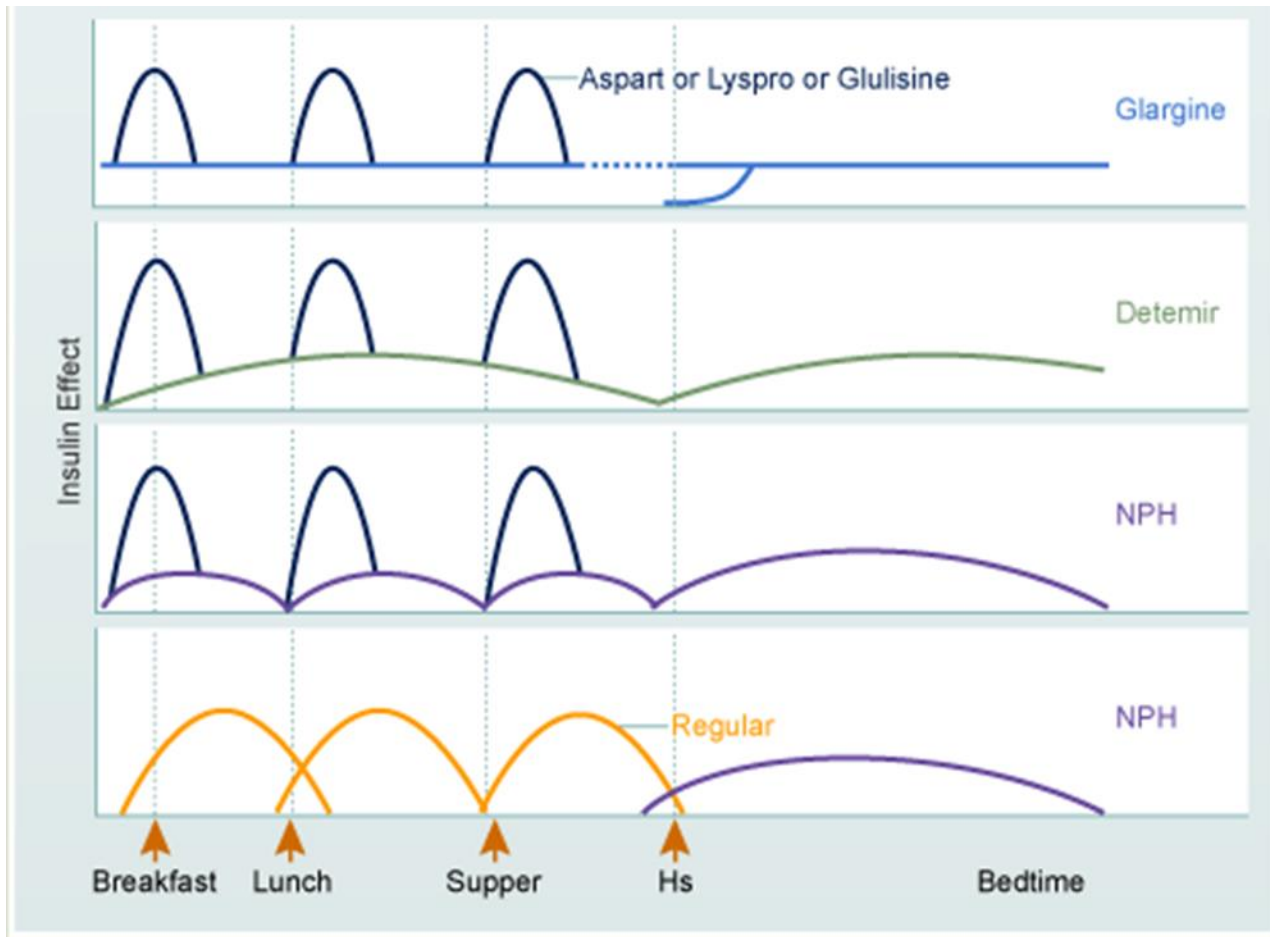


Adapted from White JR, Campbell RK, Hirsch I. Postgraduate Medicine. June 2003;113(6):30-36.



BASAL / BOLUS

40/60 OR 50/50



BASAL INSULINS

Summary of Canadian Insulin Products 2018							
Company →	Novo Nordisk		Lilly		sanofi		
↓ Category	Generic	Brand	Generic	Brand	Generic	Brand	
Intermediate Onset 1-3 h Duration up to 18 h <i>Cloudy solution</i>	NPH	Novolin ge NPH 10 mL vial 3 mL cartridge Expiry after opening: 30 days	NPH	Humulin N 10 mL vial 3 mL cartridge Prefilled Pen (KwikPen) Expiry after opening: 28 days			
Extended Long Acting Onset 90 min Duration 24 h <i>Clear solution</i>	detemir	Levemir 3 mL cartridge Prefilled Pen(FlexTouch) Expiry after opening: 42 days	glargine biosimilar	Basaglar 3 mL cartridge Prefilled Pen (Kwik pen) Expiry after opening: 28 days	glargine	Lantus 100u/mL 10 mL vial 3mL cartridge Prefilled Pen (SoloStar) Expiry after opening: 28 days	Toujeo 300u/mL *for adults only Once daily admin Prefilled Pen (SoloStar) Expiry after opening: 42 days
Ultra Long Acting Onset 1 h Duration 42 h <i>Clear solution</i>	degludec	Tresiba 100u/mL or 200u/mL Once daily admin Prefilled Pen (FlexTouch) Expiry after opening: 56 days					

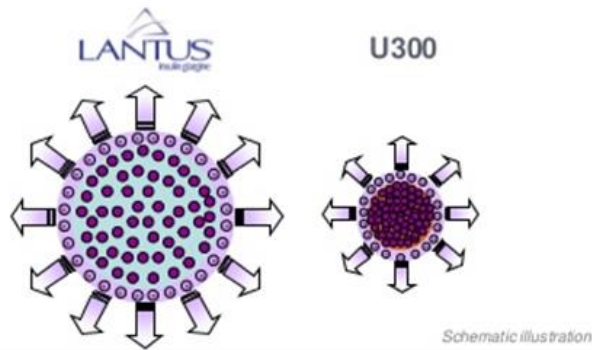


BASAL INSULINS

○ Concentrated

Toujeo

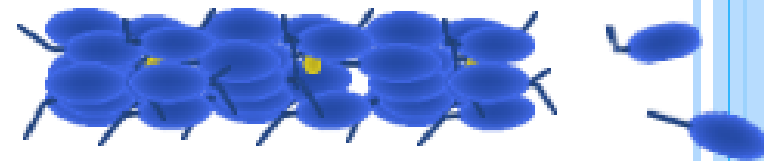
***Do not draw into a syringe!**



BASAL INSULIN

Ultra Long Acting

- Tresiba
100 u/ml
200 u/ml*



- Duration: 42 hours
- Missed dose can be taken up to 8 hours later

***Do not draw into a syringe!**



BOLUS INSULIN

Summary of Canadian Insulin Products 2018						
Company →	Novo Nordisk		Lilly			sanofi
↓Category	Generic	Brand	Generic	Brand		Generic
Fast Acting Onset 4-10 min Duration 3-5 h <i>Clear solution</i>	<u>aspart</u>	<u>Fiasp</u> 10 mL vial 3 mL cartridge Prefilled Pen (FlexTouch) Expiry after opening: 28 days				
Rapid Onset 10-15 min Duration 4-5 h <i>Clear solution</i>	<u>aspart</u>	<u>Novorapid</u> 10 mL vial 3 mL cartridge Prefilled Pen (FlexTouch) Expiry after opening: 28 days	<u>lispro</u>	<u>Humalog</u> 100u/ml 10 mL vial 3 mL cartridge Prefilled pen (<u>KwikPen</u>) 200 u/ml Prefilled pen (<u>KwikPen</u>) Expiry after opening: 28 days	<u>glulisine</u>	<u>Apidra</u> 10 mL vial 3 mL cartridge Prefilled pen (<u>Solostar</u>) Expiry after opening: 28 days
Short Onset 30-60min Duration 5-8 h <i>Clear solution</i>	regular	<u>Novolin ge Toronto</u> 10 mL vial 3 mL cartridge Expiry after opening: 30 days	regular	<u>Humulin R</u> 100u/ml 10 mL vial 3 mL cartridge Prefilled Pen (<u>KwikPen</u>) Expiry after opening: 28 days	<u>Entuzity</u> 500u/ml 3 ml cartridge Prefilled Pen (<u>KwikPen</u>) Expiry after opening: 28 days	

Prepared by: B. Young, Quality Management, March 2003. Reviewed by M. Gingras, Pharmacy, D. Hollahan, DEC, Credit Valley Hospital Rev 2007.
Revised by: D. Hollahan, W. Graham Waterloo Wellington Diabetes2015, April 2017, Nov 2017, Jan 2018



BOLUS INSULINS

Fast Acting

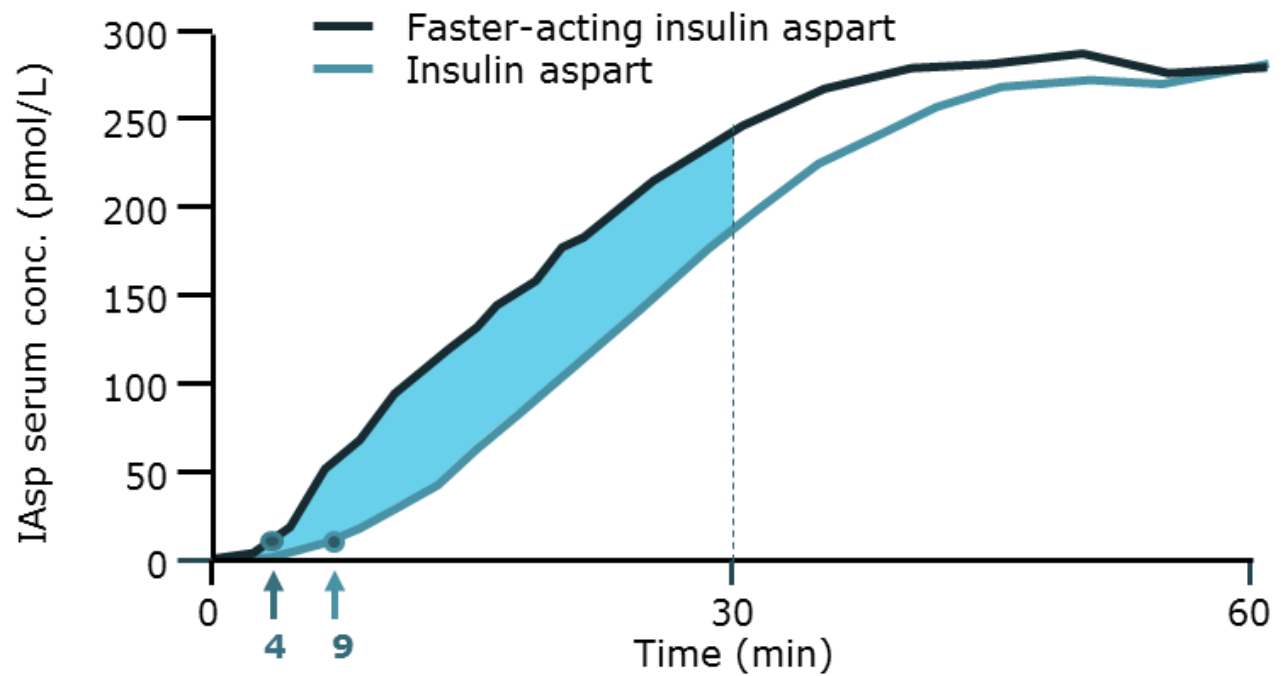
- Fiasp
 - 50% of insulin in first 30 min
 - Improved post prandial BG
 - Can be taken 20 min after a meal



BOLUS INSULIN

Fast Acting

- Fiasp



BOLUS INSULIN

Short Acting Concentrated

- Entuzity
 - Humalin R 500u/ml

***Do not draw into a syringe!**

Indication is:

- >200 units/day
- A1c > 8 %
- BMI > 40
- Dial 5 unit
- Increase by %



FIT : Recommendations for Best Practice in Injection Technique



- Injection technique
- Use of devices
- Factors Affecting Absorption
- Injection Sites
- Lipohypertrophy
- Special Populations

INSULIN REQUIREMENTS- ADULTS

0.5 units/kg body weight



INSULIN:CARBOHYDRATE RATIO



grams carbohydrate

_____ = 1 unit of insulin per _____ gm CHO

units of rapid insulin

John eats 2 sandwiches and a large apple every day for lunch.

Carbohydrate: bread $4 \times 15 = 60$, apple 20, total = 80 grams

He takes 10 units of insulin

$80/10 = 8$

His ratio is 1 unit insulin to cover 8 grams of carbohydrate



INSULIN:CARBOHYDRATE RATIO



grams carbohydrate

_____ = 1 unit of insulin per _____ gm CHO

units of rapid insulin

Sandra has a salad, chicken and a smoothie for lunch.

Carbohydrate: smoothie= 75 grams

She takes 5 units of insulin

$$75/5 = 15$$

Her ratio is 1 unit insulin to cover 15 grams of carbohydrate



USING THE RATIOS

Maureen ratio is 1:8 at breakfast

Her meal is 375 ml of rice krispies, 250 ml milk, 125 ml raspberries (38 + 12 + 8).

How much insulin would she need?

$$58/8 = 7.25$$





USING THE RATIOS

Matt uses 1:8 ratio at lunch.

He normally eats a full sub which has 74 g carbohydrate.

Today he decides to add 500 ml of chocolate milk (250 ml 24 g carb)

How much insulin would he normally use at lunch?

$$74/8=9.3$$

How much would he need today with the chocolate milk?

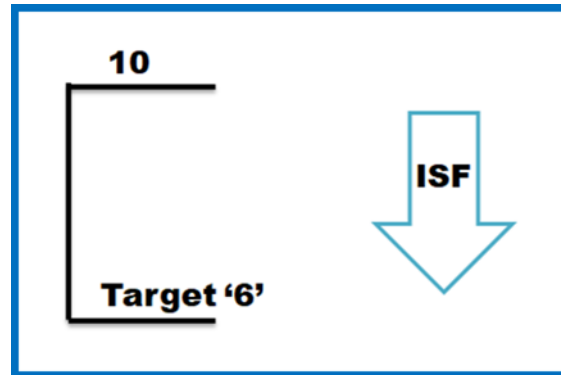
$$74+ 48= 122$$

$$122/8=15.3$$



INSULIN SENSITIVITY OR CORRECTION FACTOR

- The amount a person's blood glucose will drop (mmol/L) for each unit of insulin.
- "100 Rule"
- 100 divided by Total daily dose of insulin



INSULIN SENSITIVITY OR CORRECTION FACTOR

Francine takes 11 units of basal insulin and bolus insulin (7 + 3 + 4)

TDD = 25

Calculate the ISF $100/25=4$

1 unit (rapid insulin) will ↓ blood glucose 4mmol/L



USING ISF

Present blood glucose – target blood glucose = correction

Sam's blood glucose is 14 mmol/L

His target is 6 mmol/L

$$14 - 6 = 8$$

He needs to correct 8 mmol/L

His ISF is 1:2

$$8 / 2 = 4$$

He would take 4 extra units of rapid insulin as a correction

KATHY

- Basal bolus with Lantus and Apidra
- Ratio is 1:10
- How much insulin would she need for this meal?

- 2 slices WW toast
- 1 orange
- 175 ml artificially sweetened yogurt
- 1 egg
- Coffee, black

- a) 4 units
- b) 10 units
- c) 6 units
- d) 3 units



KATHY

- Basal bolus with Lantus and Apidra
- Ratio is 1:10
- How much insulin would she need for this meal?

- 2 slices WW toast
- 1 orange
- 175 ml artificially sweetened yogurt
- 1 egg
- Coffee, black

c) 6 units



KATHY

- Target is 7 mmol/L
- Present blood glucose 11 mmol/L
- ISF: 1 unit to decrease 2 mmol/L

How much extra insulin would Kathy require?

Blood glucose - target

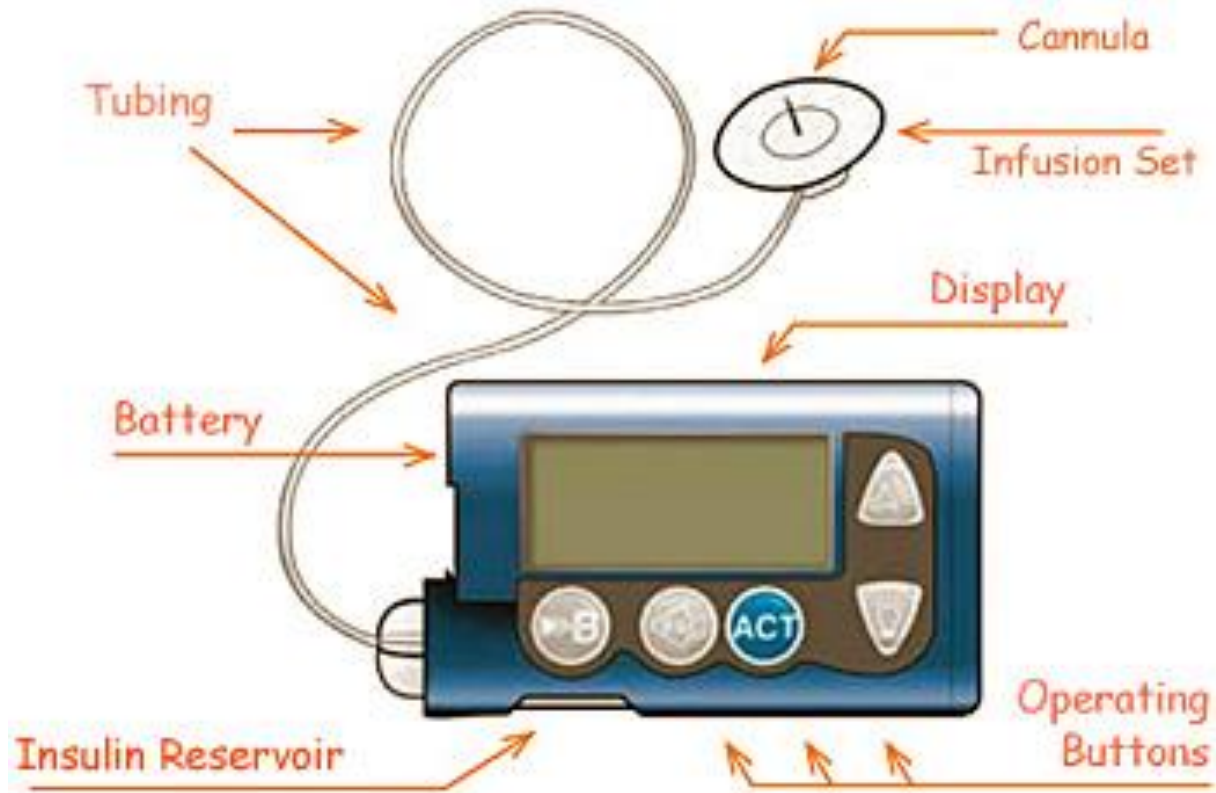
$$11 - 7 = 4$$

4 divided by ISF of 2

Kathy would add 2 extra units of insulin



PUMP THERAPY



PUMP THERAPY

Who would benefit?

- Poor blood glucose control
- Marked dawn effect
- Frequent hypoglycemia
- Erratic lifestyle
 - Sleep patterns
 - Shift work
 - Travel
 - Irregular meal times




PUMP THERAPY

Advantages

- Quality of Life
- More flexible, less injections
- Improved glycemic control
- Severe hypoglycemia
- Hypoglycemia unawareness
- Marked Dawn effect
- Very low basal rates < TDD 20 units

Disadvantages

- Cost
 - Time required for teaching
 - Technology
 - Risk of DKA if insulin flow is interrupted
- 

PUMPS

Calculating dose

0.5 unit/kg body weight

50/50 basal/bolus

Susan weighs 48 kg

$0.5 \times 48 = 24$

12 units basal/ 12 units bolus

Site
Tubing (infusion set)
Pump



PUMPS

- Basal insulin is divided by 24 (hours in day)
 - $12/24=0.5$ units per hour
- Bolus insulin is split between 3 meals depending on the relative amount of carbohydrate
 - $12/3= 4$
- For example:3, 4, 5



PUMP THERAPY

Sample Basal Insulin Rates

- 12:00 am – 3:00 am 0.5 u/h
- 3:00 am – 8:00 am 0.7 u/h
- 8:00 am – 12:00 am 0.6 u/h

Use:

I:C ratio for Mealtime bolus
ISF for corrections bolus



CONTINUOUS GLUCOSE MONITOR (CGM)

- Sensor lasts 30 days
- Transmitter lasts 90 days



DRIVING



After a low wait
45 minutes
and
ensure blood glucose
is above 5

Drive Safe with Diabetes

If you take insulin or pills that can drop your blood sugar below 4 mmol/L:

Prepare: Keep fast-acting sugar where you can reach it while driving. Keep other snacks nearby.

Be Aware of your blood sugar level before driving. Do not start driving if below 4 and treat*. For long drives, check your blood sugar every 4 hours.

Stop driving and treat* if you don't feel well.

After treating* a low, **Wait** until your blood sugar is above 5 to start driving. Your brain might need up to 40 minutes to recover after you have treated a low before you can safely drive again.

Tell your health-care provider if someone else had to help you with a low blood sugar.

Fast-acting sugar that I will keep in my car close to the driver's seat:

Snacks that I will keep nearby when I am driving:

*See the back for how to treat a low blood sugar.

diabetes.ca
 1-800-BANTING (226-8464)
 info@diabetes.ca

DIABETES CANADA

How to treat a low blood sugar

EAT fast-acting sugar

15 g of glucose in the form of glucose tablets	1 tablespoon (15 mL) of honey	1 tablespoon (15 mL) sugar in water
2/3 cup (150 mL) of juice or regular soft drink	15 g fast-acting sugar (e.g. 6 Life Savers® or 2 rolls Rocket Candy)	

WAIT 15 minutes and **CHECK**

If blood sugar is ABOVE 4.0mmol/L AND next meal is in the hour	If blood sugar is ABOVE 4.0mmol/L AND next meal is LONGER than 1 hour away	If blood sugar is BELOW 4.0mmol/L REPEAT steps above
---	---	---

Eat ONE of:

Starch: ex. 7 crackers OR 1 slice of bread

AND

Protein: ex. 1 piece of cheese OR 2 tablespoons of peanut butter

Guidelines.diabetes.ca
Patient Resources
Tools and Resources
Management

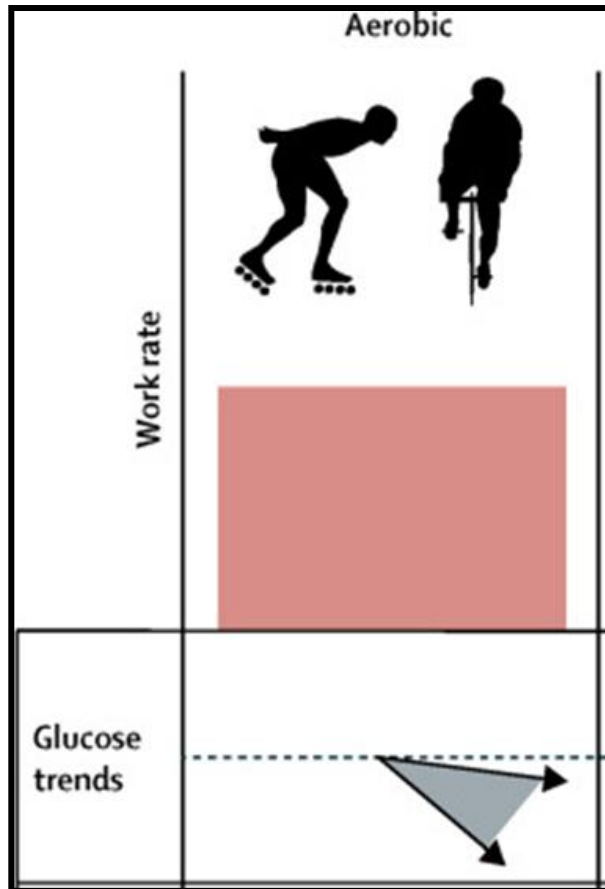
COMPENSATION FOR PHYSICAL ACTIVITY

Exercise requires:

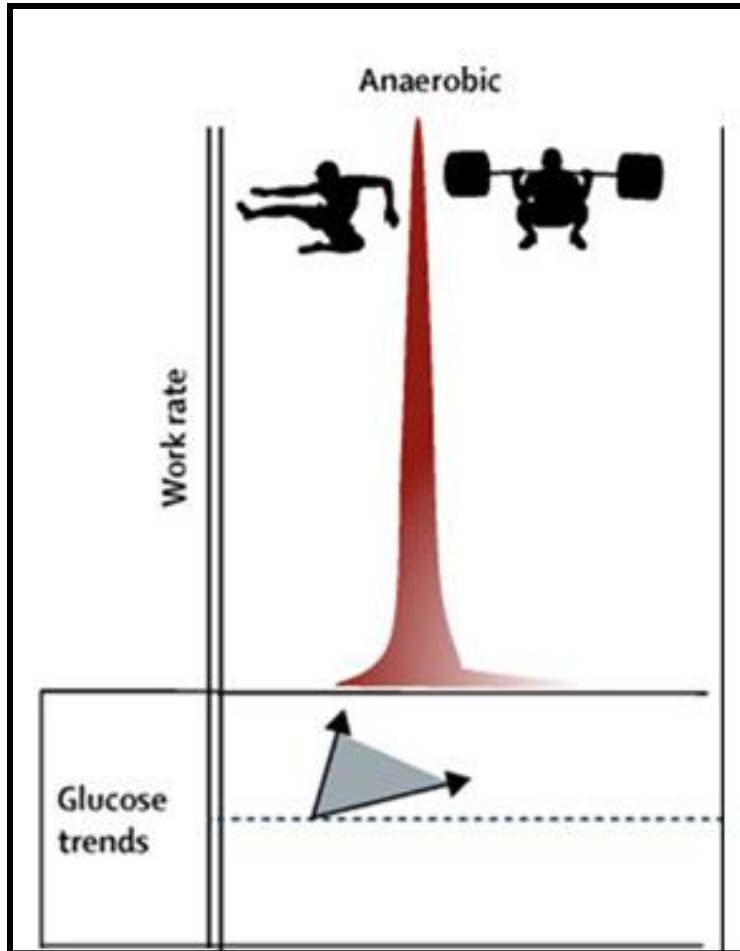
- Add additional food
- Decrease Insulin
- Both
- None



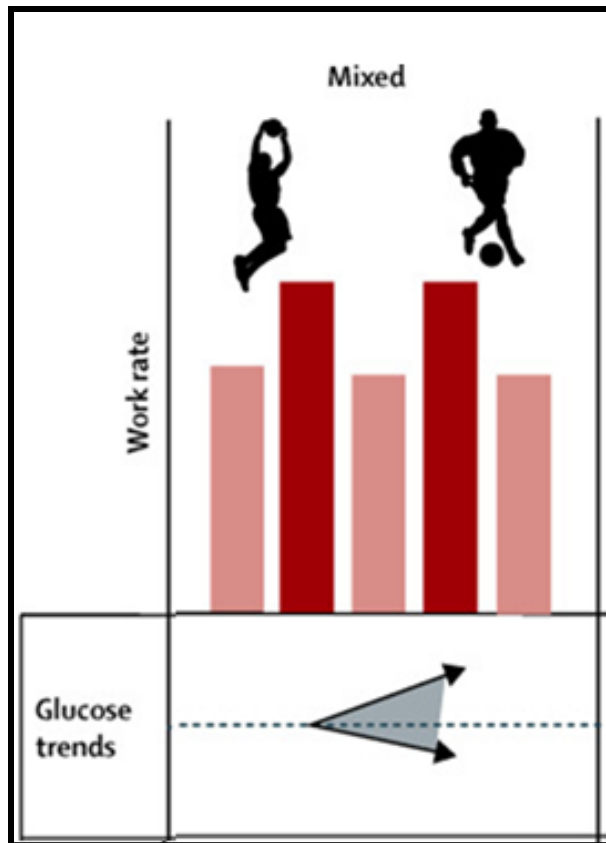
PHYSICAL ACTIVITY IN TYPE 1



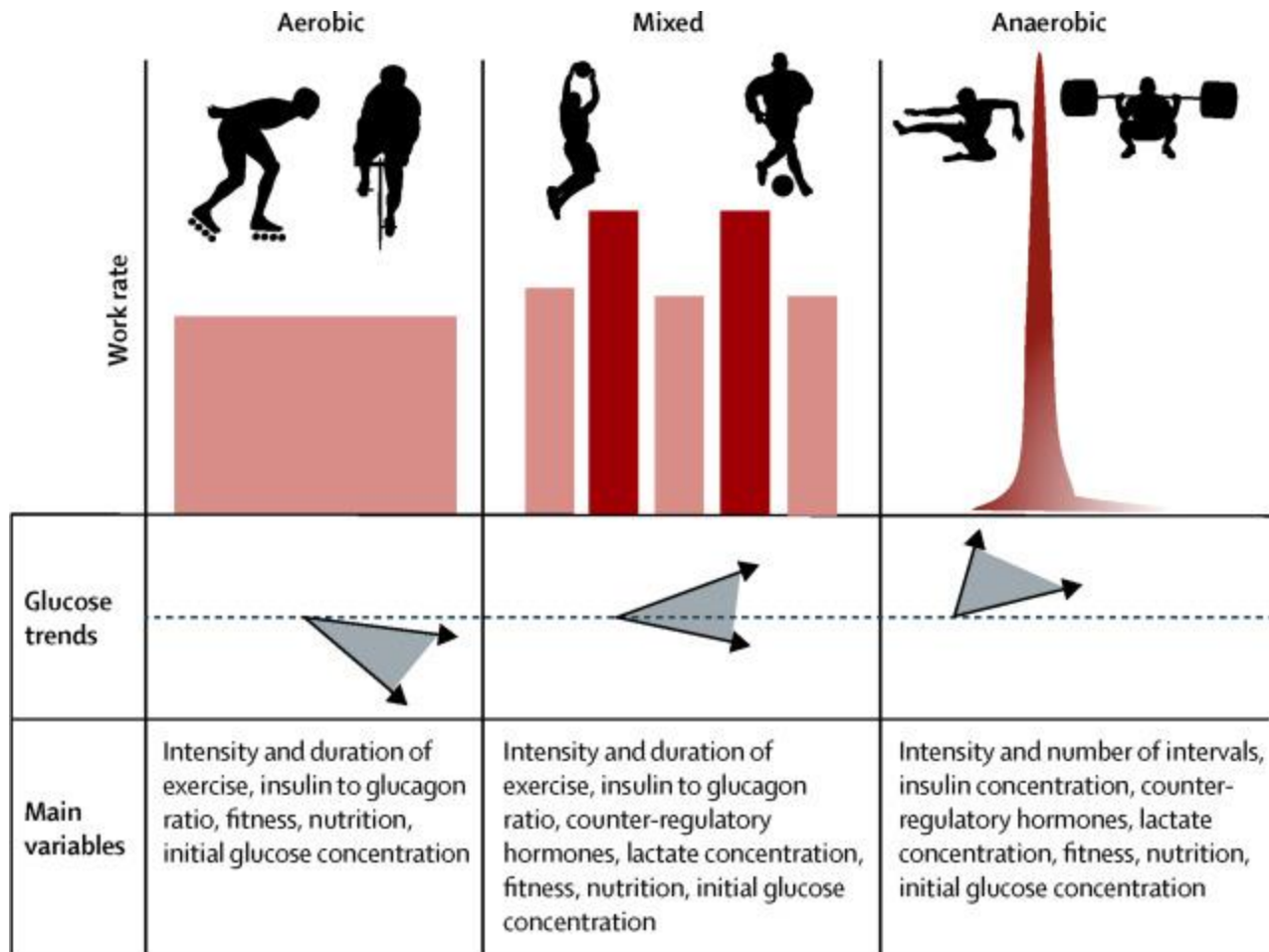
PHYSICAL ACTIVITY IN TYPE 1



PHYSICAL ACTIVITY IN TYPE 1



PHYSICAL ACTIVITY IN TYPE 1



CONSIDERATIONS FOR PHYSICAL ACTIVITY

- Timing of exercise compared to meal
- Blood glucose before starting exercise
- Weight goal: maintenance or loss
- Type of exercise
- Avoidance of injections in exercising muscles
- Do not exercise if blood glucose is above 16.7 mmol/L

Hypoglycemia can occur up to 24 hours after an activity



Do NOT EXERCISE!

Blood Glucose 16.7 or above



Severe hypoglycemia in previous 24 hours



COMPENSATION FOR PHYSICAL ACTIVITY

	Insulin	Carbohydrate
Light exercise	Reduce bolus by 10%	Add 10 grams before activity (May not be needed)
Moderate Exercise	Reduce Bolus by 20%	Add 15-30 grams before exercise
Vigorous Activity	Reduce Bolus by 30-50%	Add 30-60 before or after exercise



HYPOGLYCEMIA

Definition

- the development of autonomic or neuroglycopenic symptoms
- a low plasma glucose level (<4.0 mmol/L for patients treated with insulin or an insulin secretagogue); and
- symptoms responding to the administration of carbohydrate. The severity of hypoglycemia is defined by clinical manifestations



HYPOGLYCEMIA

Severity of hypoglycemia

- Mild: Autonomic symptoms are present. The individual is able to self-treat.
- Moderate: Autonomic and neuroglycopenic symptoms are present. The individual is able to self-treat.
- Severe: Individual requires assistance of another person.
- Unconsciousness may occur. PG is typically <2.8 mmol/L.



HYPOGLYCEMIA SYMPTOMS

Neurogenic (autonomic)

- Trembling
- Palpitations
- Sweating
- Anxiety
- Hunger
- Nausea
- Tingling

Neuroglycopenic

- Difficulty concentrating
- Confusion
- Weakness
- Drowsiness
- Vision changes
- Difficulty speaking
- Headache
- Dizziness



HYPOGLYCEMIA

Teach glucagon to family members

Carry glucagon when traveling



TREATMENT FOR HYPOGLYCEMIA

- 15 grams of carbohydrate



RISK FACTORS FOR SEVERE HYPOGLYCEMIA

- Prior episode of severe hypoglycemia
- Current low A1C (<6.0%)
- Hypoglycemia unawareness
- Long duration of insulin therapy
- Autonomic neuropathy
- Low economic status
- Food insecurity
- Low health literacy
- Cognitive impairment
- Adolescence



SICK DAY MANAGEMENT

- Illness can result in elevated blood glucose requiring more insulin
- NEVER omit insulin even if vomiting
- Untreated hyperglycemia can result in DKA



SICK DAY MANAGEMENT

Sick Day Guidelines for Insulin users

S	Sugar	Check every 2-4 hours
I	Insulin	Continue to take it!
C	Carbohydrate	Take some every 1-2 hours
K	Ketones	Test if your blood glucose is above 16



Illnesses like a cold, flu or sore throat can cause your blood sugar to rise. It is important to continue to monitor your blood sugar levels, eat and/or drink, and take insulin. Insulin often needs to be increased during an illness.

Always take your _____ (long acting insulin)

Take your _____ (rapid insulin)

If you are able to eat/drink.

Use the chart on the next page to add extra insulin.

Call your Health Care provider if you:

- Vomit more than twice in 12 hours
- Have severe stomach pain
- Have rapid breathing
- Have a rapid heart beat
- Have fruity smelling breath (ketones)
- Have difficulty staying awake

Often when people are sick they prefer to nibble or sip fluids during the day. Be sure to include items with carbohydrate. Use the sample meals below as a guide. Add sugar-free fluids to prevent dehydration.

- Breakfast:** 1/2 cup apple juice and 8 crackers (Carbohydrate 30 grams)
+ water or sugar free beverages
- Morning snack:** 4 melba toast or 3/4 cup of gingerale (Carbohydrate 15 grams)
+ sugar free beverages
- Lunch:** 3 arrowroot cookies and 1/2 cup regular jello (Carbohydrate 30grams)
+ water or sugar free beverages
- Afternoon snack:** 1 ready-to-serve pudding (Carbohydrate 25 grams)
+ sugar free beverages
- Evening meal:** 1/2 cup mashed potatoes and 1/2 cup gingerale (Carbohydrate 30 grams)
+ water or sugar free beverages
- Evening snack:** 1 popsicle (2 sticks) (Carbohydrate 20 grams)

Clear Fluids

For People with Diabetes

"Clear Fluids" means you can see through them and there are no particles or pulp.

Carbohydrates need to be consumed anytime you are using clear fluids, to provide glucose for energy. You will need to continue with your medication and insulin to control blood sugars. In addition to carbohydrate containing beverages you will need sugar free fluids to prevent dehydration.



CAUTION: Red and purple beverages are to be avoided when preparing for a colonoscopy.

Here is a sample menu to use.

- Breakfast:** 2/3 cup apple juice and 1/2 cup gingerale (Carbohydrate 30 grams)
- Morning snack:** 1 cup powerade or 3/4 cup of gingerale (Carbohydrate 15 grams)
- Lunch:** 1/2 cup white grape juice and 1/4 cup regular jello (Carbohydrate 30grams)
- Afternoon snack:** 1 cup regular gingerale (Carbohydrate 15 grams)
- Evening meal:** 1/2 cup regular jello and 3/4 cup Gatorade (Carbohydrate 30 grams)
- Evening snack:** 1/2 cup regular jello and 1 popsicle (Carbohydrate 20 grams)

Carbohydrate Beverages

Each contain 10 grams of carbohydrate and can be substituted in the menu:

- Apple Juice: 1/3 cup
- Cranberry Juice (white): 1/4 cup
- Cranberry Cocktail (white): 1/3 cup
- Cranberry Cocktail Low Calorie : 1 cup
- Gatorade: 3/4 cup
- Grape Juice (white): 1/4 cup
- Powerade: 3/4 cup
- Regular Jello: 1/4 cup
- Regular Iced Tea: 1/3 cup
- Regular Gingerale: 1/4 cup
- Regular Popsicle: 1 stick

Sugar Free Beverages:

- Clear Coffee or Tea
- Clear Broth
- Club Soda
- Crystal Light
- Diet Cranberry
- Diet Jello
- Diet Pop
- Powerade Zero
- Water



Use as desired

INSULIN ADJUSTMENT FOR SICK DAYS

Blood Glucose mmol/L	Blood Ketones mmol/L	Urine Ketones	Action Required My rapid insulin is _____
< 3.9	negative		Decrease pre-meal insulin
4.0- 16.0	<0.6	+ or -	Usual insulin dose
4.0 – 16.0	≥ 0.6	Small light purple +2	Add an Extra 10% in addition to pre-meal dose
>16.0	<0.6	+ or -	Add an Extra 10% in addition to pre-meal dose
>16.0	≥0.7- 1.4	Moderate purple +3	Add an Extra 15% in addition to pre-meal dose
>16.0	≥1.5 – 3.0	Large dark purple +3	Add an Extra 20% every 4 hours in addition pre-meal dose Contact your Dr. or healthcare team as soon as possible.



OTHER AUTOIMMUNE COMORBIDITIES

- Thyroid
 - 15-30%
 - Screening is important
- Celiac
 - 4-9% ?
 - Silent
- Addison Disease
 - Recurrent hypoglycemia
 - Decreased insulin requirements



OTHER THERAPIES

- Metformin
- Liraglutide
- SGLT2



DAWN 2 STUDY

Which statement about people with type 1 diabetes is accurate?

- a) 49% of people experience diabetes distress
- b) 10 % of people have depression
- c) 90% of people feel their health care providers listen to them
- d) 90% of people were helped to set goals by their health care providers



ELEVATED BLOOD SUGAR

What is the name given to an elevated blood sugar following a low blood sugar?

a) Dawn Effect

b) Pseudo hypoglycemia

✓ c) Somogyi effect

d) Szycowski effect





QUESTIONS



DIABETES AND CHILDREN



GOALS:

- Optimal Growth and development
 - Physical and psychologically
- Prevent severe hypoglycemia
 - Disrupts cognitive function
 - Severe Hypoglycemia age <6 can result in later cognitive impairment
- No symptoms of hyperglycemia
 - Hyperglycemia has also been shown to affect cognitive function
- Lots of Energy
- Interest in Friends and Activities
- Regular School Attendance



CHALLENGES

- Growth spurts
 - **HORMONES**
 - Altered patterns of eating and activity
- Recognition of Hypoglycemia
 - Nocturnal Hypoglycemia
 - Fear of seizures (parents)
- Changing behavior
 - Is this a normal response for a child this age or is this diabetes related?
- Variable Appetite
- Food Jags
- Illness
 - Regular colds, flu, infections require additional attention to maintain blood sugar control and prevent DKA



INSULIN DOSE

- Children .3-.5 u/kg
- Adolescents 1.0-1.5 u/kg



BLOOD SUGAR TARGETS

Age	A1c	AC Meals	2 hr PC Meals
<18	≤7.5	4-8	5-10



BLOOD SUGAR TARGETS

Preprandial 6-10

- Severe or excessive hypoglycemia
- Hypoglycemia unawareness



RATIONAL FOR TARGETS

- Infants/Toddlers/Preschool
 - Unpredictable food intake
 - Can't recognize hypoglycemia
 - Prevent Hypoglycemia due to effect on cognitive function
- School Age
 - Communicate Hypoglycemia
 - Food more predictable
 - Lacking in Judgment
- Teenagers
 - Recognize and Treat Hypoglycemia
 - Understand concept of Balance
 - Able to Plan Ahead



HONEYMOON

- Can last from a few weeks up to 2 years
- Good blood glucose control with decreased insulin requirements
- Insulin may even be stopped



HYPOGLYCEMIA

Child's Age	< 5	5-10	> 10
Carbohydrate	5 g	10 g	15 g

Mini dose glucagon 10 ug per year of age

- minimum 20 ug,
- maximum 150 ug



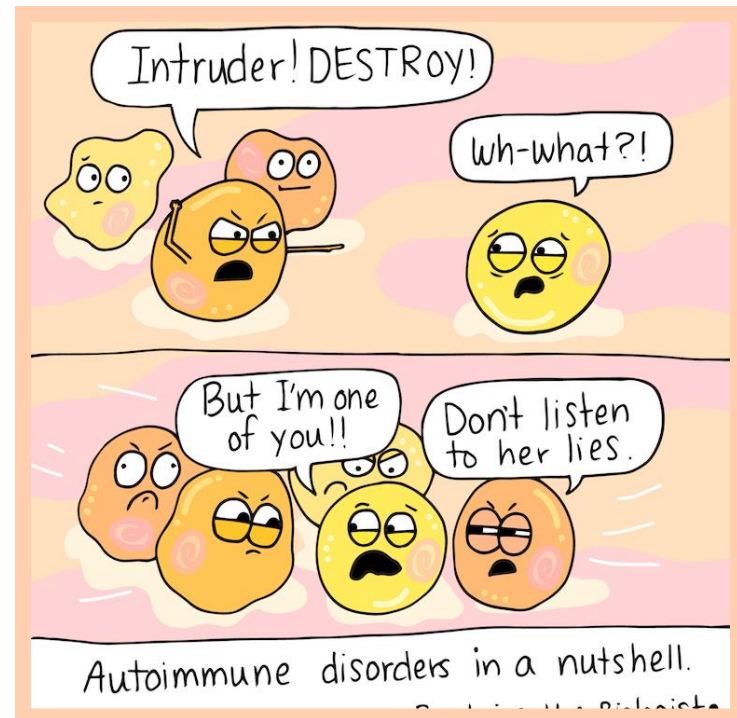
GLUCAGON



OTHER AUTOIMMUNE DISEASE

Thyroid

- Most likely girls at onset of puberty
- Testing at Diagnosis and every 2 years
- +ve antibodies screen 6-12 months



OTHER AUTOIMMUNE DISEASE

Celiac

- 4-9% of children with Type 1
- Screening controversial,
Done as clinically indicated

No wheat, rye, barley
Non-contaminated oats



Screening for Complications

Screen at:

Nephropathy	<ul style="list-style-type: none">• Age 12 with 5 years duration-yearly
Retinopathy	<ul style="list-style-type: none">• Age 15 and 5 years duration-yearly
Neuropathy	<ul style="list-style-type: none">• Post puberty, 5 years duration and Poor Control
Hypertension	<ul style="list-style-type: none">• twice per years
Dyslipidemia	<ul style="list-style-type: none">• age 12 and 17 or• <12 if BMI > 97th or fam history



EATING DISORDERS

Females with diabetes have a 2 fold risk of eating disorders



EATING DISORDERS

- Anorexia- restriction of calories
 - Inadequate food intake
- Binge Eating
- Bulimia
 - binge eating then purging
 - Food intake is often out of control when binging
- Diabulimia-Insulin under dosing or omission

A1c over 12% is indicative of insulin omission



EATING DISORDERS RED FLAGS!

- Unexplained lows
- Unexplained weight loss or lack of weight gain
- A1c above 10%
- Restriction of carbohydrate
- A1c/meter and log book discrepancy
- Recurrent DKA
- Reverting to symptoms pre-diagnosis
- Lack of fingerpricks



EATING DISORDERS

8 - 30 % of Adolescents with diabetes have either an eating disorder or disordered eating.



MISC

- Flu shots yearly
- Females counseling about contraception
- Alcohol
- Recreational drugs
- Driving



RISK OF DEVELOPING TYPE 1 DIABETES?

- Identical Twin 1 in 2-3 chances
- Father 1 in 16-20 chances
- Sibling 1 in 20 chances
- Mother, child born before age 25
1 in 25 chances
- Mother, child born after age 25
1 in 100 chances
- No Family Members 1 in 250-400 chances




TEENAGER

- Jessica is a 17 year old who has had diabetes for 12 years. She had a recent admissions for DKA and has lost 20 pounds since her last clinic visit.
- What would be the most likely cause of the weight loss?
 - a) Additional exercise
 - b) Starvation diet
 - ✓ c) Insulin omission
 - d) Less hypoglycemia from frequent use of fibre snacks



TEENAGER


Mr. & Mrs. Singh are quite upset that their daughter's A1c has increased to 9.3% from the previous level of 7.6%. You noticed when seeing the 13 year old, that she had started to mature physically. Your best explanation to the parents would be?

- a) All teenagers cheat when away from their parents
- b) The A1c of 9.3 % is acceptable for a teenager
-  c) Teenagers experience a surge of hormones that requires increased insulin
- d) The blood glucose control is important to reduce the risk of complications once puberty is reached.



SICK DAY MANAGEMENT

Justine has just had her wisdom teeth removed. She is trying to convert her lunch to liquids which she can tolerate. She normally has 45 grams of carbohydrate. Which answer is **not** equivalent ?

- a) 1 cup orange juice and 1 stick of popsicle
-  b) 1 cup jello and 1 cup apple juice
- c) 1 pudding cup and $\frac{1}{2}$ cup ice cream
- d) 1 cup chicken noodle soup and 8 crackers and $\frac{1}{2}$ cup gingerale



Questions



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