



INFORMATION BOOKLET FOR CHILDREN WITH TYPE 1 DIABETES AND THEIR PARENTS

PRODUCED UNDER THE AUSPICES OF
TYPE 1 DIABETES IN INDIA (T1DI) PROJECT

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INTRODUCTION



This information booklet is a guide to children with type 1 diabetes (T1DM) and their parents/caregivers regarding their condition. This booklet tries to address the various doubts and concerns related to the management of T1DM. It will also create awareness and gives information about T1DM and its complications.

The booklet aims to:

- ☺ Increase awareness of symptoms, complications, and management of diabetes
- ☺ To improve the lives of children with T1DM and help them lead a long and healthy life.
- ☺ To help parents/caregivers know more about T1DM, do's and don'ts and help them to manage their children's condition better.



TYPE 1 DIABETES MELLITUS (T1DM)

T1DM mostly has sudden onset in children and adolescents, and can be easily identified by classic symptoms.

T1DM is a condition in which the immune system destroys the insulin-producing beta cells of the pancreas.



It can strike at any age varying from below 1 year of age to elderly age usually occurs in children and adolescents.

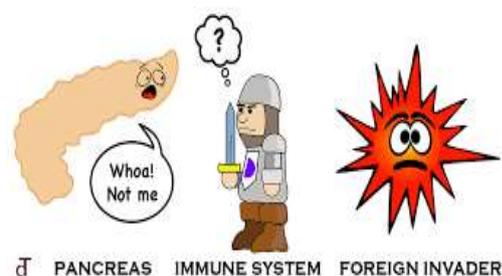
T1DM accounts for 5 to 10 percent of all diagnosed cases of diabetes and is the leading cause of diabetes in children and adolescents.

T1DM cannot be prevented.
Note: It's not your fault.

Since the pancreas in T1DM can no longer produce insulin, those with T1DM are required to take insulin daily, either by injection or via an insulin pump.

RISK FACTORS

- A combination of genetic and environmental factors put people at increased risk for T1DM.
 1. Viral infections
 2. Race/Ethnicity
 3. Family history
 4. An early diet like consuming cow's milk
 5. Other autoimmune conditions like Graves's disease
 6. Presence of certain genes



- *However, researchers are still working to identify the specific genes and environmental risk factors to stop the autoimmune process that destroys the pancreatic beta cells.*

SYMPTOMS

SYMPTOMS OF DIABETES

- Excessive Thirst and Hunger
- Excess Urination
- Tiredness
- Sudden Weight Loss
- Delayed Wound Healing

REMEMBER 50%
OF INDIVIDUALS WITH **DIABETES**
HAVE NO **SYMPTOMS** AT ALL

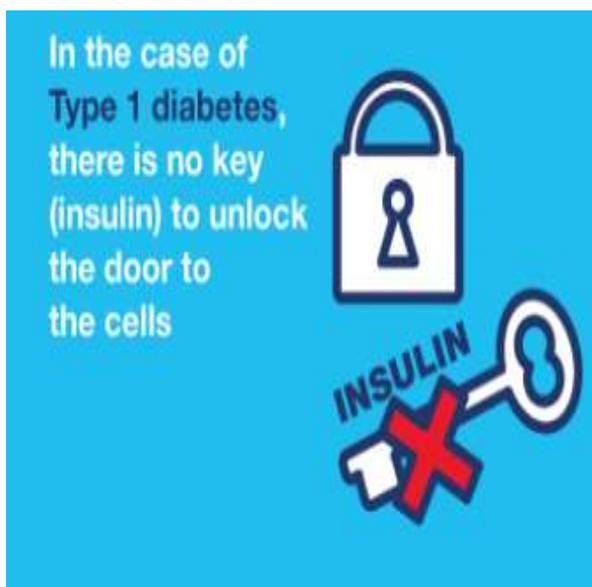
4 'T'S OF DIABETES

An illustration showing four white icons on a pink background. From left to right: a person drinking from a glass, a toilet, a person in bed with "ZZZ" above their head, and a thin person. Below each icon is the word "THIRST", "TOILET", "TIREDNESS", and "THINNER" respectively.

THIRST TOILET TIREDNESS THINNER

- Symptoms become apparent when most of the beta-cells get destroyed over a short period.
- As insulin deficiency worsens, ketone bodies (formed from the breakdown of fat) build up in the blood. They get excreted in the urine and breath; a condition called diabetic ketoacidosis (DKA). DKA is sometimes the first sign at the diagnosis of T1DM. If diabetes goes undiagnosed and not treated with insulin at this point, the individual can lapse into a life-threatening diabetic coma.

NEED FOR INSULIN



When food is eaten, it gets digested and broken down into different compounds. Glucose, a simple sugar, is one of those compounds. Our body uses glucose to produce energy, grow, self-repair, and perform other cellular functions. However, before cells can use glucose, insulin is needed to move glucose from the blood into the cells.

The pancreas, an organ found behind the stomach, produces many hormones including insulin. More specifically, the islets of Langerhans are special pancreatic cells, called *beta cells* that produce insulin. The pancreas normally releases a small amount of insulin (25 to 40 units) 24 hours a day (basal insulin) and in response to food (bolus insulin).

Since insulin secretion is disrupted in T1DM, external insulin is the main form of treatment for those with T1DM. The insulin currently available mimic the action of the pancreas. Different types of insulin were developed to better care for the needs of T1DM. Insulin administration in most T1DM requires much more, between 0.5 and 1.0 unit/Kg body weight daily, when administrated subcutaneously.

The American Diabetes Association characterizes insulin by the way it works.

- *Onset* is defined as the length of time insulin hits your bloodstream and begins to lower blood glucose.
- *Peak* is the time during which insulin is at its “peak” or maximum effectiveness at lowering blood glucose.
- *Duration* is the length of time insulin continues to lower blood glucose.

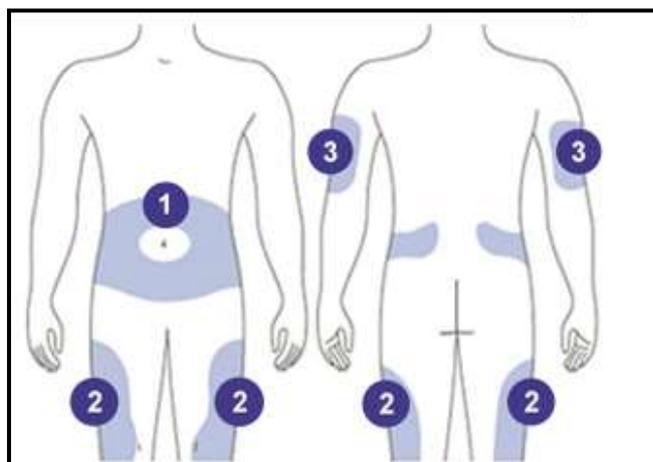
TYPES OF INSULIN AND DURATION OF ACTION

The five types of insulin are (ADA):

- **Rapid-acting insulin** begins to work about 15 minutes after injection, peaks in about 1 or 2 hours after injection, and last between 2 to 4 hours. (Insulin Aspart NovoLog), Insulin Glulisine (Apidra), Insulin Lispro (Humalog)
- **Short-acting insulin** usually reaches the bloodstream within 30 minutes after injection, peaks anywhere from 2 to 3 hours after injection, and is active for approximately 3 to 6 hours. (Humulin R, Humulin R U-500, Novolin R, Novolin R Pen Fill)
- **Intermediate-acting insulin** generally reaches the bloodstream about 2 to 4 hours after injection, peaks 4 to 12 hours later, and is effective for about 12 to 18 hours. (Humulin N, Humulin N Pen, Novolin N, Novolin N Pen Fill)
- **Long-acting insulin** reaches the bloodstream several hours after injection and tends to lower glucose levels up to 24 hours. (Insulin Detemir, Insulin Degludec, Insulin Glargine)
- **Ultra-long-acting insulin** reaches the bloodstream in 6 hours, does not peak, and lasts about 36 hours or longer. (Tresiba, Toujeo)

INSTRUCTIONS FOR SELF ADMINISTRATION OF INSULIN

Insulin is measured in units and comes in varying strengths. The commonly used strengths are 40 units per millilitre (U-40) or 100 units per millilitre (U-100). Always use the corresponding syringes (i.e., U-40 syringes with U-40 insulin and U-100 syringes with U-100 insulin).



THE STOMACH – Except for a 2-inch circle around the navel

THE TOP AND OUTER THIGHS- Avoid administering too close to the bony area above the knee

THE OUTER, UPPER ARMS–Use the outer back area of the upper arm where there is fatty tissue

THE BUTTOCKS – Upper and outer part of the buttocks.

The stomach has the fastest rate of absorption, followed by the arms, thighs, and buttocks.

DRAWING AND INJECTING INSULIN

PREPARATION FOR VIALS

You can either administer insulin through pens, syringe, or a pump



Refer: https://www.d1abesties.com/images/kiran/eng_4.pdf

Refer: <https://blog.bluecircle.foundation/diabetes-waste-disposal-are-we-doing-it-right/>

DO'S AND DONT'S FOLLOWED IN INSULIN INJECTION

	DO'S	DON'T'S
1	Take insulin (depends on the type of insulin) 30 minutes before food (or), as advised by your doctor.	Skip or stop insulin without your doctor's knowledge
2	Use appropriate syringes (U-40 insulin with U- 40 syringes, U- 100 insulin with U- 100 syringes)	Using bent needles or blunt syringes.
3	Make use of the correct injection sites	Self-inject in your arms.
4	Store insulin in the door of the refrigerator. Insulin can also be put into a bag, wrapped carefully, and put into a pot of cold water for storage if the fridge is not available.	Store in the freezer compartment of the refrigerator.
5	Try to take insulin on your own instead of depending on others.	Use syringes more than 3-4 times.
6	Store insulin in a cold vessel during travel	Expose insulin to direct sunlight.
7	Roll the insulin bottle between your palms (if it is too cold) before injection.	Inject insulin when the bottle is still icy.

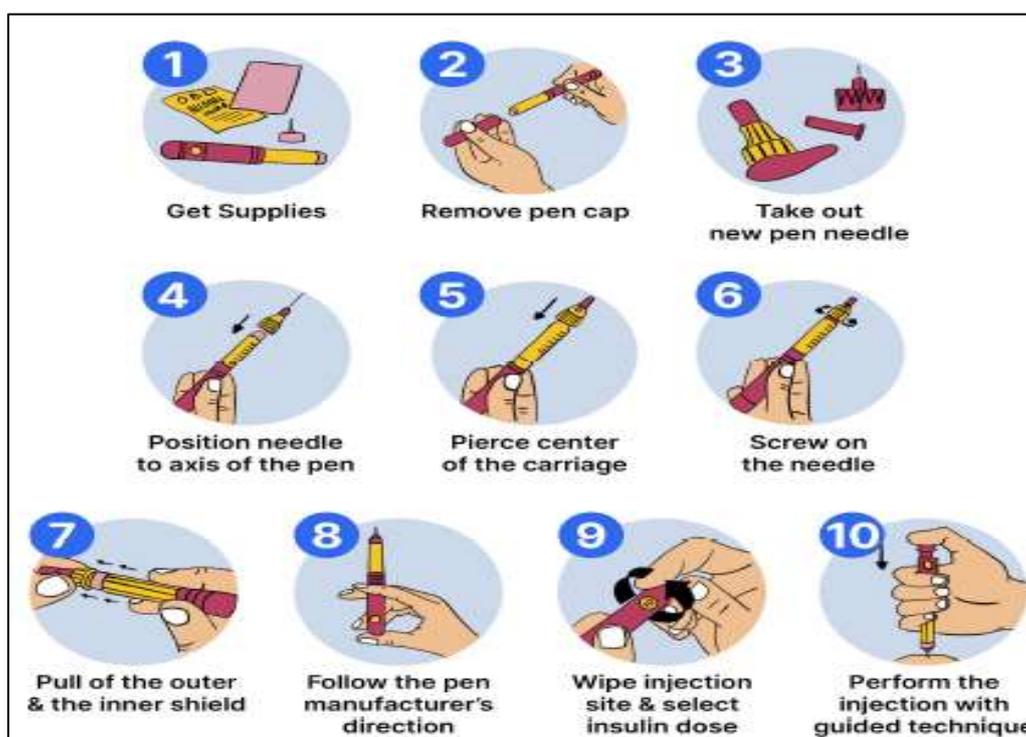
INSULIN PENS

An insulin pen is a convenient and relatively painless way to deliver insulin shots by which insulin is given through micro-fine needles. Insulin pens are available in two basic types, disposable and reusable. Disposable pens are available pre-filled with insulin. Reusable pens have a replaceable cartridge of insulin. Each insulin pen contains 300 units of insulin. In comparison to the conventional syringe and needle, pen injection has certain unique advantages as given below:

- Insulin pens are portable, discreet, and convenient to carry
- No need to draw insulin as it is already pre-filled in the self-contained cartridge and helps save time.
- Doses are easily dialled making it easier to set an accurate dose for people who have vision problems.
- More accurate dosing mechanisms
- Faster and easier than conventional syringes
- Improved patient acceptance and compliance



HOW TO ADMINISTER INSULIN PEN



Refer: (https://www.d1abesties.com/images/kiran/eng_4.pdf)

CONTINUOUS SUBCUTANEOUS INSULIN INFUSION: CSII PUMP

A continuous subcutaneous insulin infusion (CSII) pump is a device which continuously infuses a small measured amount of insulin subcutaneously. It is a small battery-operated device consist of a pump reservoir, a soft, flexible tube known as an infusion set, and a computer chip to control insulin delivery. One end of the infusion set has a connector that connects to the reservoir of the pump and can be connected during bathing and swimming. The other end of the side has a cannula, which is inserted subcutaneously with the help of an insertion device. The cannula is taped in place and can be kept for three days. The reservoir can hold up to 300 units of insulin, i.e., 3ml of 100 U/ml, which is usually sufficient for three days. Rapid-acting analogs and regular insulin can be used in the pump.

Advantages :

1. The insulin pump imitates the physiological pattern of insulin secretion.
2. It is a small pager or mobile-phone sized electronic device and is lightweight.
3. It has fewer hypoglycaemic episodes.
4. No need for multiple injection pricks and insulin requirements per day may fall by 10 to 15%.
5. Excellent improvement in metabolic control and it gives flexibility with timing and composition of meals.



SELF MONITORING BLOOD GLUCOSE (SMBG)

Self-Monitoring of blood glucose (SMBG) is one of the most useful methods to assess diabetes control. All children with T1DM should monitor their blood glucose levels using test strips and meters, which are now widely available.

Keep track of your blood sugars by Regular MONITORING:

SMBG (self-monitoring of blood glucose) at least 4 times/ day.

Check **URINE KETONES** if unexplained blood glucose is > 250 mg/ dl on 2 consecutive occasions or if any illness or infection



Advantages of self-monitoring of blood glucose

- It allows blood glucose levels to be conveniently estimated at any time of the day or night, which enables the patient and doctor to get a clear picture of the fluctuation in blood sugar.
- It allows the patient to have flexibility in his lifestyle.
- SMBG is the only practical method to diagnose hypoglycemia at the precise time of its occurrence.
- SMBG helps to improve blood sugar control and achieve a better HbA1C level.

Monitoring of blood glucose limitations

- Follow the instructions according to the guidelines given, or the result may be misleading.
- It is essential to cross-check the accuracy of meter reading. There could be a 10-15% variation between reading on meters and lab values.

CONTINUOUS GLUCOSE MONITORING SYSTEM (CGMS)



CGMS is a glucose monitoring device indicated for detecting trends and tracking patterns in persons with diabetes. This system is equipped with a software that can generate reports to provide a graph known as the ambulatory glucose profile (AGP), a visual snapshot which helps the doctors easily understand when sugar levels go high and low (hypoglycaemia or hyperglycaemia) over a typical 24-hour period, detect overnight hypoglycaemia and identify postprandial (sugar levels after taking food) glucose spikes.

CLINICAL BENEFITS OF AGP

- ✓ It identifies the reasons for the mismatch between the patient's glycaemic profile and HbA1c results
- ✓ It assesses a patient's glucose levels versus target range
- ✓ It helps us to understand the extent and causes of high blood glucose variability
- ✓ It also estimates the suitability of insulin treatment and whether it is safe to increase the insulin dose
- ✓ AGP facilitates patient understanding of the interactions between their condition, everyday living, and insulin use

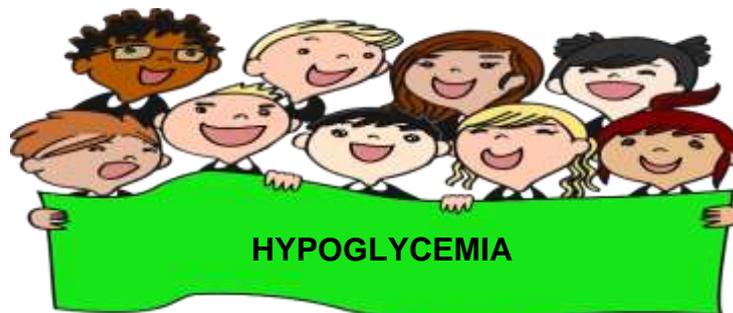
SICK DAY GUIDELINES



During sickness or any other illness such as cough, cold, fever, nausea, vomiting, etc., children with T1DM needs to take certain precautions.

- ⊖ Insulin must be administered daily, even if you are not well or not consumed your food regularly. However, the dose may need to be adjusted based on the blood sugar level.
- ⊖ Test urine and blood sugar frequently, a minimum of four times a day.
- ⊖ If urine glucose is 1% or more, or blood glucose is higher than 200mg/dl, check for urine ketones. If ketones are present with high glucose levels, you will need extra insulin.
- ⊖ Take liquids every hour. If unable to take liquids due to nausea and vomiting, contact your physician so that he/ she may suggest drugs to stop vomiting or give you intravenous fluids.
- ⊖ If you have a high fever or any other serious problem, contact your doctor at once.
- ⊖ If you are too ill to follow your usual diet, take liquid foods at 2-3 hour intervals. In addition to water, have some fruit juices (without sugar) and soups as you return to your regular diet.

- ⊖ Check your blood sugar levels to see whether you need extra insulin. Keep a record of the blood sugar level, the amount of insulin administered, and the time and so on.
- ⊖ Take rest and keep warm. Do not exercise. Have someone take care of you.



What is hypoglycemia (low sugar)?

Hypoglycemia is an abnormally low sugar level in the blood. It can be dangerous if neglected. So, it is vital to recognize the symptoms and treat them promptly.

Symptoms: The symptoms of low blood sugar may differ from person to person and also in the same person from time to time.

	<p>MILD</p> <p>EXCESS HUNGER SWEATING SHIVERING PALPITATION GIDDINESS</p> <p>SEVERE</p> <p>FITS UNCONSCIOUSNESS</p>
--	---

CAUSES OF LOW GLUCOSE LEVEL IN BLOOD

	<ul style="list-style-type: none"> ■ SKIPPED/DELAYED MEAL ■ ILLNESS ■ OVERDOSE OF MEDICATION ■ OVER EXERTION
--	--

- ⊗ Having a smaller amount of carbohydrate in a meal
- ⊗ Overdoing any form of physical activity
- ⊗ Consumption of excessive alcohol

Treatment of hypoglycemia (Rule of 15)

If the symptoms are mild, take any food or drink that is readily available

Take sugar or glucose if the sign is very severe

Severe hypoglycemia can lead to loss of consciousness and need intravenous glucose.

How to Treat Low Blood Sugar (Hypoglycemia)

1.  Eat/Drink 15 g Carbs
2.  Wait 15 Minutes
3.  Check Blood
4.  Less than 70 mg/dl? Repeat Steps 1-4

American Diabetes Association

Diabetes

Prevention of hypoglycemia

Hypoglycemia can be dangerous,
but can be prevented



- ▶ Follow 4 meal pattern
- ▶ Include low calorie foods in-between main meals
- ▶ Reduce dosage of diabetes medication or insulin if symptoms occur
- ▶ Slightly increase food intake if you plan to exercise more
- ▶ Carry glucose / food / chocolate during travel



Remember

Always carry your diabetes identity card and glucose or sugar with you whenever you go. It could save your life.

DIABETIC KETOACIDOSIS (DKA)

Diabetic ketoacidosis (DKA) is a life-threatening problem that affects people with diabetes. High blood sugar, acidosis, and dehydration together cause the condition known as DKA. Infection, injury, a severe illness, missing doses of insulin shots, or surgery can lead to DKA in people with T1DM.

SYMPTOMS OF DKA

- Vomiting
- Dehydration
- An unusual smell on the breath –sometimes compared to the smell of nail polish remover
- Deep labored breathing (called Kussmaul breathing) or hyperventilation
- Rapid heartbeat
- Confusion and disorientation
- Coma

CAUSES AND RISK FACTORS FOR DIABETIC KETOACIDOSIS

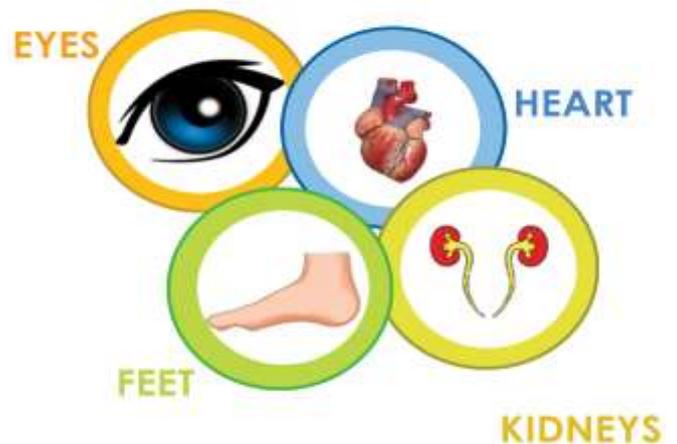
- Having blood glucose levels consistently over 15 mmol/l
- Missing insulin injections
- If a fault has developed in your insulin pen or insulin pump
- As a result of illness or infections
- High or prolonged levels of stress
- Excessive alcohol consumption

TREATMENT

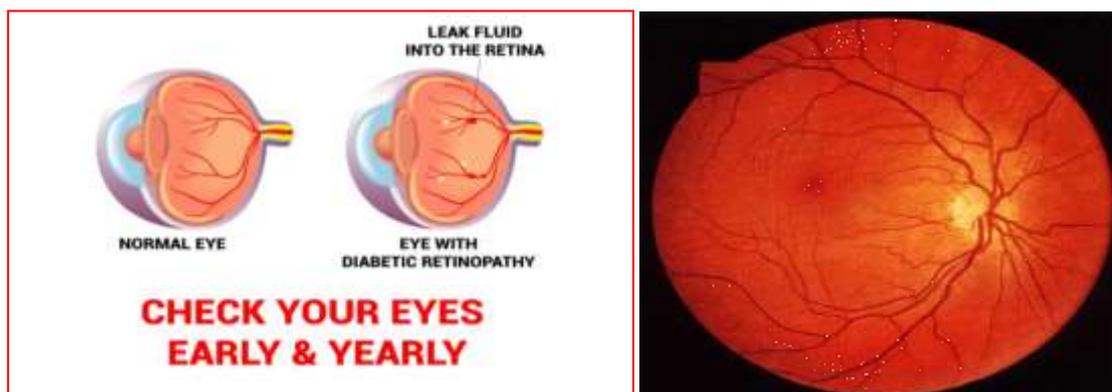
- Administer intravenous fluids to correct dehydration and to replace any salts that are lost from the body during ketoacidosis.
- Insulin is required to suppress the ketone bodies that the body manufactures instantly.

COMPLICATIONS OF DIABETES

T1DM individuals are at risk for long-term complications (damage to the cardiovascular system, kidneys, eyes, nerves, blood vessels, etc.). Acute (ketoacidosis and hypoglycemia) and chronic complications (retinopathy, neuropathy, nephropathy, cardiovascular disease, and peripheral vascular diseases) lead to increased morbidity and premature mortality in T1DM.



DIABETIC RETINOPATHY

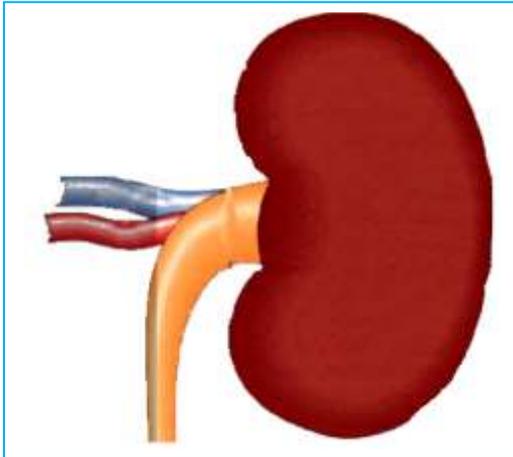


It is an eye disease caused due to

- Long term uncontrolled diabetes
- High blood pressure
- Family history of eye disease

ADA has recommended an initial dilated and comprehensive eye examination (T1DM duration for 3 to 5 years, age \geq ten years or puberty has started, whichever is earlier). After the initial investigation, an annual routine follow-up is generally recommended.

DIABETIC NEPHROPATHY



Early (reversible) stages are asymptomatic.

If untreated can lead to kidney failure.

Detected by simple blood and urine tests like

- Urea
- Creatinine
- P/C Ratio (protein test)
- Microalbuminuria

Nephropathy is 100% reversible in the early stages.

ADA recommends screening for albuminuria with a random (morning sample preferred) spot urine sample for albumin-to-creatinine ratio annually at puberty or age >10 years, whichever is earlier, once the child has had diabetes for five years.

DIABETES AND HEART DISEASE



RISK FACTORS FOR HEART DISEASE

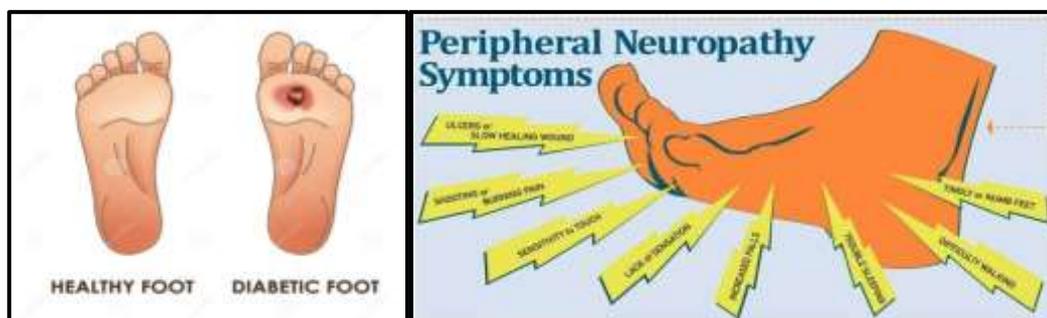
HYPERTENSION - Blood pressure should be measured at each routine visit. Confirmation of high blood pressure (systolic blood pressure or diastolic blood pressure $\geq 90^{\text{th}}$ / $\geq 95^{\text{th}}$ percentile for age, sex, and height) in children must be done on three separate days. Initial treatment includes dietary modification and increased exercise, if appropriate, aimed at weight control. ADA recommends pharmacologic

treatment if the target blood pressure is not reached by the children within 3–6 months of initiating lifestyle intervention.

DYSLIPIDEMIA - Fasting lipid profile should be done in children \geq ten years of age soon after the diagnosis of diabetes (after control of blood glucose). If LDL cholesterol values are within the accepted risk level (<100 mg/dL), a lipid profile repeated every 3–5 years is reasonable. If the lipid values are abnormal, initial therapy should consist of optimizing glucose control and medical nutrition therapy. ADA recommends pharmacologic treatment if the target lipid profile is not reached despite medical nutrition therapy and lifestyle changes. The goal of treatment is an LDL cholesterol value <100 mg/dL.

SMOKING/ALCOHOL—ADA recommends to discourage smoking/alcohol in youth who do not and encourage smoking/alcohol cessation in those who have the habit.

DIABETES AND FEET



Uncontrolled diabetes can lead to significant foot problems due to damage to nerves and blood vessels.

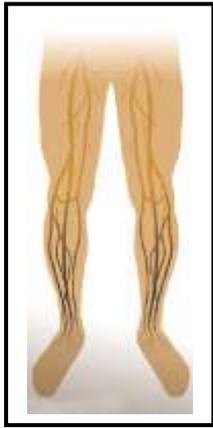
Nerve damage (Neuropathy)

Damage to sensory nerves

Damage to motor nerves

Damage to autonomic nerves

Blood vessel damage (Peripheral Vascular Disease – PVD)



High blood glucose levels damage the blood vessels, and it can lead to narrowing or complete occlusion of the affected blood vessel leading to gangrene.

Foot Examination - to check for early symptoms of neuropathy, ischemia (reduced blood supply), deformities in the foot, callus formations resulting from neuropathy and infection.

Biothesiometry - helps to detect and quantify the loss of foot sensation in patients with diabetes.

Doppler - helps in the detection of decreased blood circulation in the foot (ischemia)

Foot pressure distribution measurement – helps in measuring the pressures in regions of the foot that are prone to getting calluses and corns—also used for designing special diabetic footwear that effectively redistributes the stresses, thereby preventing the formation of calluses and corns.

Consider an annual comprehensive foot exam at the start of puberty or age \geq ten years, whichever is earlier, once the youth has had T1DM for five years (ADA).

Do's and Don'ts in Footcare

- ☺ Do not use pain balms, hot water bottles, electric blankets, or foot spas, do not sit close to boiling or icy objects.
- ☺ Avoid walking barefoot as you might step on something and damage your skin leading to infection.
- ☺ Avoid self-treatment such as using blades or chemicals to treat wounds and corn plaster to remove corns.
- ☺ Avoid toe grip, flip flop, pointed, tight, or high heeled footwear
- ☺ Inspect your feet daily, wash them, and completely dry before going to bed.
- ☺ Use therapeutic footwear according to your foot condition and deformity.

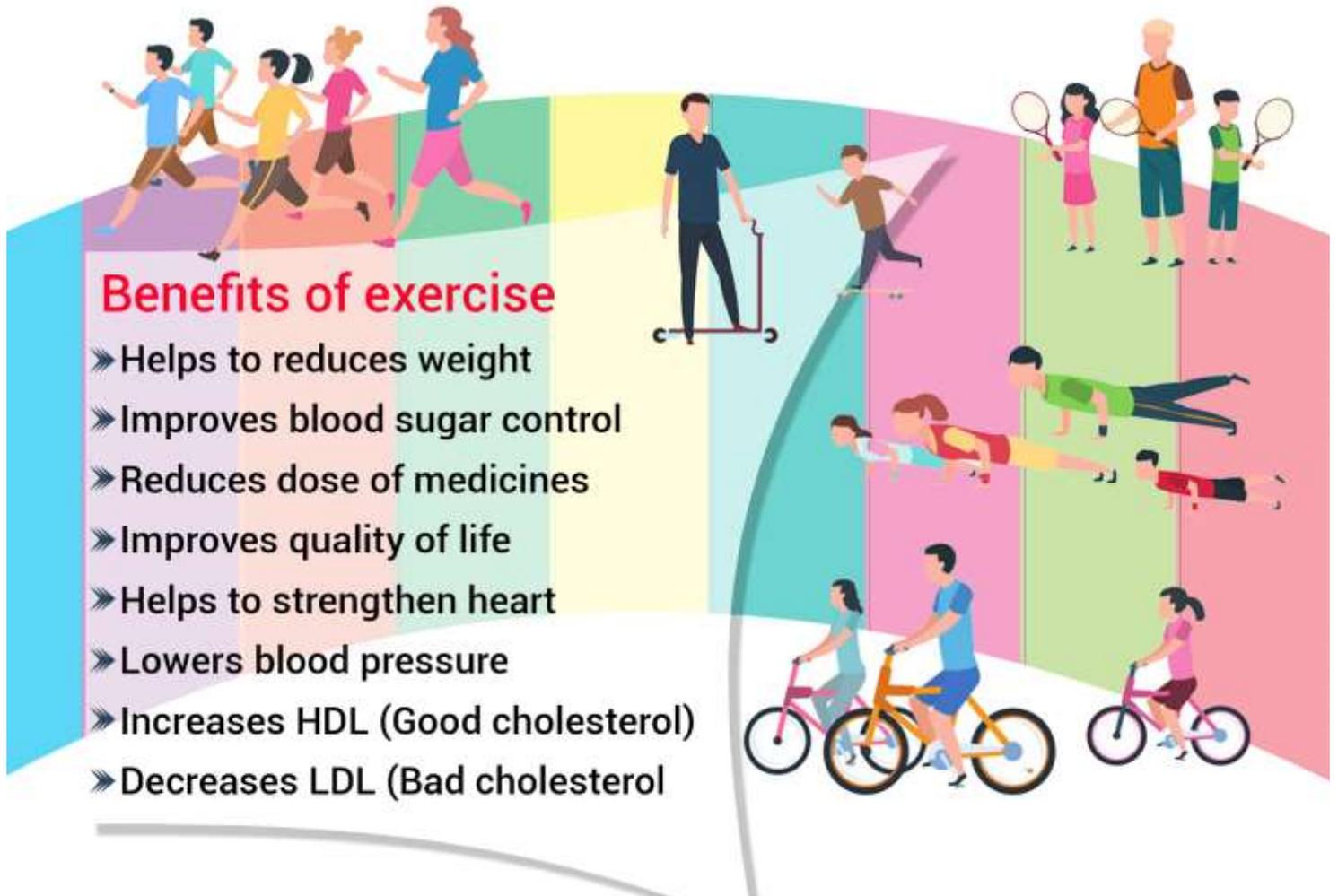
Blood glucose target recommendations

Glycemic targets	NICE goal	ISPAD goal	ADA goal
A1C (%)	≤6.5	<7.0	<7.5
Pre meal (mg/dl)	70 - 126	70 – 130	90 - 130
Post meal (mg/dl)	90 - 162	90 – 180	
Pre bed (mg/dl)	70 - 126	80 – 140	90 - 150

ADA – American Diabetes Association; ISPAD – International Society for Paediatric and Adolescent Diabetes;
NICE – National Institute for Health and Care Excellence; A1C – Glycated hemoglobin



PHYSICAL ACTIVITY



Benefits of exercise

- Helps to reduce weight
- Improves blood sugar control
- Reduces dose of medicines
- Improves quality of life
- Helps to strengthen heart
- Lowers blood pressure
- Increases HDL (Good cholesterol)
- Decreases LDL (Bad cholesterol)

How to start

- Begin and end each session with a warm-up (5 to 10 min.) and cool down (5 to 10 min.) period.
- Each exercise session should last at least 30 minutes and, if possible, go up to 45 minutes to 1 hour.
- Brisk walking is recommended.

Precautions

- Always carry a diabetes identity card.
- Carry sugar, glucose, or candy with you.
- Drink plenty of water to avoid dehydration.
- Patients who have bleeding in the eyes should avoid strenuous exercise.
- Proper walking shoes should be worn.

- Monitor feet closely for blisters before and after exercise.
- Pain is a warning sign. If pain or cramps continue, seek medical advice.
- If any chest pain or discomfort develops, immediately stop the exercise.

Practical tips to increase physical activity in daily life

- Choose a longer route while walking.
- Use the steps instead of the elevator.
- Park your car or scooter farther away from your destination and walk the rest of the way.

DIABETIC DIET- GENERAL GUIDELINES



- Diet is an essential aspect of the treatment of diabetes. The diet should be similar to the patient's daily food pattern and that of his family.
- Include whole-grain cereals in the daily diet.
- Vegetable protein like dhals, pulses, and legumes are better than animal proteins. A combination of cereal and pulse will enhance protein quality. Mushrooms are low in calories but are rich in protein.
- Fibre-rich foods are very good for controlling diabetes and for reducing blood cholesterol. Rich sources of natural fiber are whole cereals, pulses like Bengal gram, black gram, green gram, and green leafy vegetables. Soluble fiber from fenugreek seeds taken either as sprouted or in powder form can be supportive therapy.

- The vegetables taken in unlimited amounts is given as **Annexure 1**.
- Reduction of fat intake can prevent raised blood cholesterol and prevent atherosclerosis (hardness of arteries). Reduce total fat and saturated fat. Use vegetable oils in moderation.
- The intake of total calories must also be reduced, especially for those who are overweight. Distribute the daily diet pattern into frequent small feeds. Skipping a meal or fasting is not advisable.

Free Foods:

Consumption of unlimited amounts of free foods is allowed as it contains few calories. Examples include skimmed buttermilk, unsweetened lime/tomato juice, clear soup, pepper water (rasam), vegetable salads like tomatoes, cucumber, onion, white radish, lettuce, capsicum.



A bowl of salad
100 gms= 25 Calories

Foods to be avoided:

- Sugar, honey, glucose, jam, jaggery, sweets, cakes, pastries, tender coconut water, coconut, soft drinks, alcoholic beverages, health drinks, dry fruits like dates, figs, and raisins. Banana, mango, jack fruit, sapota, custard apple, and grapes are best avoided because they are rich in carbohydrates.



- Avoid all biscuits that contain sugar and fat.
- Moderately use carrot, beetroot, peas, and double beans.
- Avoid potatoes, yam, colocasia, and tapioca.
- Nuts like almonds, groundnut, walnut, cashew nut, pista are rich in fat but are free from cholesterol. They can be taken in limited quantities replacing the fat calories.
- When blood sugar is under control, take fruits like apple, orange, sweet lime, papaya, guava, pear, muskmelon, watermelon, etc.

CARBOHYDRATE COUNTING



It is a meal planning approach where one learns to:

- Identify the carbohydrate content in the meals
- Estimate the total carbohydrate in the meal
- Calculate the insulin needed to match the carb to be eaten
- Control postprandial glucose levels more efficiently

It is simple and quick to learn and use. The General thumb rule is that

1 Exchange = 1 choice = 1 carb = 1 portion = 1 CP (carb portion) = 1 CU

(carb unit) = 15g carbohydrate



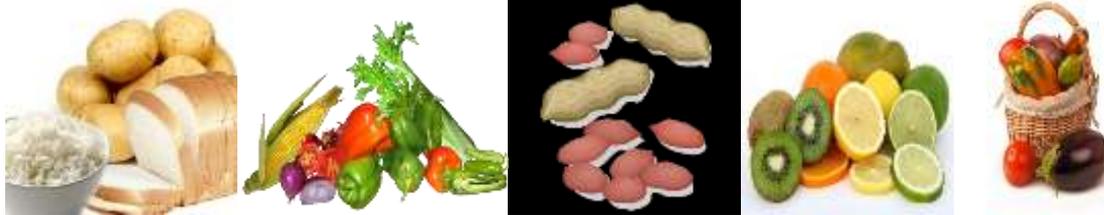
Here are some examples of food items which provide 15 grams of carbohydrates

Food item	Quantity	Carbohydrate (g)	Carbohydrate Choice portion
Milk	1 cup	3	1/5
Idly	1 no.	15	1
Dosai	1 no.	20	1 1/4
Chutney-onion/tomato/greens	2 tbsp	5	1/3
Pongal	1 Katori	30	2
Chappathi	1 no.	15	1
Veg kurma	1 Katori	10	3/5
Salad - Veg	1katori	7	1/2
Soup - Non cream	1 bowl	15.5	1
Rice	1 Katori	25	1 2/3
Sambar - Plain	1katori	16	1
Rice -mixed (lime / tamarind /	1 bowl	75	5
Rice- Veg / pulao/ biriyani	1 bowl	68	4.5
Curds	1 Katori	3	1/5
Sandwich	2 slices	14	1

CARBOHYDRATES AND GLYCAEMIC INDEX

The carbohydrate effect can be estimated with the help of the glycaemic index.

- Glycaemic Index (GI) measures the speed at which food gets digested and converted to glucose.
- Based on the glycaemic index, foods are classified as High, Medium, and Low glycaemic index foods.
- High GI - foods that break down quickly during digestion and release glucose rapidly into the bloodstream tend to have a high GI. E.g., White rice, white bread, corn flakes, baked potatoes, watermelon, etc.



- Low GI – foods that break down more slowly, releasing glucose more gradually into the bloodstream, tend to have a low GI. E.g., most of the fruits and vegetables, legumes, pulses, milk, curd, etc.
- High glycaemic index food will raise the blood glucose both higher and more quickly than a lower glycaemic index
- For example, adding vegetables/ whole grams, sprouts to the white rice, idly, etc. will lower GI. Increase the fibre in the food by having green leafy vegetables, salads to slow down digestion and absorption.

FOOD LABELS

- The nutrition exchange values in packed and processed foods are only average; they are not accurate for every food in a group.
- The carbohydrate content of the wholemeal is estimated using exchanges; there may be a fairly significant difference between the exchange estimate and the actual value.
- Information labels- The label lists the number of calories, carbohydrate, protein, and fat in a specified serving of the food and other information.

Sample label showing the nutrition facts.

<h3 style="margin: 0;">Nutrition Facts</h3> <p style="margin: 0;">Serving Size 1 cup (240 ml) Servings Per Container 8</p> <p style="margin: 0;">Calories 90 Calories from Fat 35</p>	Amount/Serving	%DV*	Amount/Serving	%DV*
	Total Fat 4g	6%	Sodium 120mg	5%
Sat Fat 0.5g	3%	Potassium 300mg	8%	
Trans Fat 0g		Total Carb 8g	3%	
Polyunsaturated Fat 2.5g		Dietary Fiber 1g	4%	
Monounsaturated Fat 1g		Sugars 7g		
Cholesterol 0mg	0%	Protein 7g	14%	
Vitamin A 10% • Vitamin C 0% • Calcium 30% • Iron 6% Vitamin D 30% • Riboflavin 30% • Folate 6% Vitamin B12 50% • Magnesium 10% • Zinc 4% • Selenium 8%				
*Percent Daily Values based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.				

INGREDIENTS: ORGANIC SOYMILK (FILTERED WATER, ORGANIC SOYBEANS), ORGANIC DRIED CANE SYRUP, CALCIUM CARBONATE, NATURAL FLAVORS, SALT, CARRAGEENAN, ZINC GLUCONATE, VITAMIN B12, VITAMIN A PALMITATE, VITAMIN D2, RIBOFLAVIN (B2), SODIUM SELENATE.

	2,000	2,500
Total Fat	Less than 65g	80g
Sat Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400 mg
Potassium	Less than 3,500mg	3,500mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g
Protein	50g	65g

FAMILY ISSUES AND SUPPORT: ROLE OF PARENTS AND OTHER FAMILY MEMBERS

Families can be encouraged to share their concerns with physicians, diabetes educators, dietitians, and other health care providers to get their help in the day-to-day management of diabetes.

When a child is diagnosed with diabetes, it is not unusual for parents and other caregivers to pass through stages of grief, fear, guilt, anger, denial, resentment, and even depression.

Keep T1DM children needs in mind and explain to them why their sibling with diabetes requires extra care and attention.



Important to work through these feelings, with professional help if needed, so that you can adapt to the needs of your child's health

Parent worries about behaviour, schooling, child's future, etc., are frequently magnified in families consisting of a child with diabetes.

Other children may have differing and strong emotions about their brother or sister with diabetes. Their feelings may include guilt, fear, jealousy, embarrassment or sadness.

Stress of caring for a youngster with diabetes can worsen any pre-existing psychological, social or financial problems that the family is already facing. Diabetes can cause frustration, since perfect control is never achieved, and the condition is constantly changing throughout childhood and adolescence.



POINTERS TO

PARENTS & CARE GIVERS

- ☺ Living with diabetes can put families under considerable stress, so access to extended family support is crucial.
- ☺ Understanding all the different aspects of diabetes and its treatment requires patience but will benefit your child and family life.
- ☺ Don't let your child use diabetes as an excuse to avoid things or situations that may be unpleasant. Nor should you do it.
- ☺ Encourage full participation in academic, social, and sports activities.
- ☺ Reassure your child - especially when they're younger - that diabetes is not their fault and that they didn't do anything to cause it. The same holds for you.
- ☺ Parents should be alert for signs of depression or eating disorders or insulin omission to lose weight and seek appropriate treatment.
- ☺ Help your child develop healthy eating habits. Maintain a regular schedule for meals and snacks. If your child is a fussy eater, don't force foods. Offer a variety of foods.
- ☺ Parents should talk to their children about avoiding tobacco, alcohol, and other drugs, as it is particularly crucial for children and adolescents with diabetes.
- ☺ Learn how to administer insulin injections. Insulin is usually injected into the skin over the abdomen or the thighs. Understand and teach the child the symptoms of low blood glucose (hypoglycemia) and diabetic acidosis and how to tackle them. Make sure your child has a source of sugar such as a sweet candy or sugar cubes on hand at all times to treat low blood sugar.
- ☺ Measure blood glucose levels four times daily in the initial stage and teach your child how to do this as soon as they are old enough. Self-monitoring of blood glucose in children is essential to avoid fluctuations in blood glucose.

- ☺ Teach your child how to self-administer insulin injections as soon as they are old enough - around the age of nine is typical.
- ☺ Make exercise a daily routine for the child.
- ☺ See the doctor regularly, and particularly if your child becomes ill for any reason (e.g., fever and other infections) - treatment will need to be adjusted.
- ☺ Inform and explain to the school and neighborhood friends about the symptoms of low blood glucose and what to do about them. Meet with your child's school staff to make sure they understand the individual needs of a child with diabetes. Get to know the person who in charge of your child's health needs.
- ☺ Do not hesitate to ask for help in meeting these challenges. Contact your local diabetes association for help and support. Join parents' discussion groups or support groups to learn how others are facing the same issues that you are.

There is no single recipe for managing diabetes that fits all children. Blood glucose targets, frequency of blood glucose testing, type, dose, and frequency of insulin, use of insulin injections with a syringe or a pen or pump, use of oral glucose-lowering medication, and details of nutrition management all may vary among individuals. The family and diabetes care team determine the regimen that best suits each child's characteristics and circumstances.



Annexure 1: FOOD EXCHANGE LISTS

- Food exchanges assign an average carbohydrate value per exchange to all the foods in each food group.

Exchanges	Portion size	Carbohydrate value
Starches	60 gms	15 grams carbohydrate= 1 Carb
Rice/Bread	½ katorie/1 slice	
Legumes/Pulses	25 gms ½ cup	15 grams carbohydrate= 1 Carb
Fruits		
Apple	100 gms (1 small)	15 grams carbohydrate= 1 Carb
Banana	45 gms (1/2 small)	
Grapes	150 gms (30 nos)	
Milk	200 ml (1 glass)	12 grams carbohydrate= 1 Carb (close enough)
Vegetables	250 gms	5 grams carbohydrate= 1/3 Carb
Green leafy/other		3 serving = 1 carb
Fats	Negligible	0 grams carbohydrate= 0 Carb
Meat-Protein	Negligible	0 grams carbohydrate= 0 Carb



VEGETABLES TAKEN IN UNLIMITED AMOUNTS

Ash gourd	Cluster beans	Mint
Beans	Coriander leaves	Papaya
Bitter gourd	Cowpea-pod (Karamani)	Plantain flower
Bottle gourd	Cucumber	Plantain stem
Brinjal	Curry leaves	Ridge gourd
Broad beans	Drumstick	Snake gourd
Brussels sprouts	Giant chilies (capsicum)	Tomato
Broccoli	Ginger	Tinda
Cabbage	Greens (all varieties)	Turnip
Calabash (cucumber)	Knolkhol	Radish
Cauliflower	Kovai	Onions
Chow-chow	Ladies finger	

Our web pages

<https://drmohans.com/category/blogs/>

<https://drmohans.com/#speciality>

<https://drmohans.com/patient-care/diabetic-foot-care/>

<http://dmhcp.in/products.html>

Additional websites for references:

Growth charts for boys and girls <https://iapindia.org/iap-growth-charts/>

Myths and facts about diabetes https://www.d1abesties.com/images/kiran/eng_6.pdf

Hyperglycemia https://www.d1abesties.com/images/kiran/eng_2.pdf

Steps for insulin injection <https://www.bd.com/resource.aspx?IDX=11020&CMP=PIG>

Insulin disposal <https://blog.bluecircle.foundation/diabetes-waste-disposal-are-we-doing-it-right/>

Sick day management <https://blog.bluecircle.foundation/sick-day-management-with-diabetes/>

Hypo management: <https://blog.bluecircle.foundation/hypo-management-guide/>

DKA: <https://blog.bluecircle.foundation/understanding-dka/>