Mishti - Guardian

(a CDiC initiative to empower parents and families of children with type 1 diabetes)

Issue - IV Dec 2016

Diabetes Educators and parents form a crucial component of the diabetes care team. With their support and special attention, we could bring huge change in the lives of many children with type 1 diabetes. In this 4th issue of the Mishti Guardian newsletter, the medium of connecting parents and other care givers of children with type 1 diabetes, we have compiled interesting articles, stories and facts. This is to support in their endevour for offering a good quality of life for these children. It is truly rewarding to see these children with type 1 diabetes, smile & enjoy good quality of life.

Diabetes is a disorder, which affects the child and his/her parents all the time. It is a fact that Type 1 diabetes is a demanding condition to have. It changes the entire life of the child and family members, because it means, not only multiple daily injections for a lifetime but also changes in your lifestyle. This includes food and daily activities, continuous vigil and care along with constant contact with hospitals. There is no holiday for diabetes management. It is definitely a challenging task, but once managed with discipline it gives good results. Given proper treatment and education, these children can grow up to be productive adults. You all will agree that, diabetes self – management education and awareness is the most effective mean to empower children with type 1 diabetes to manage diabetes on the long run.

In this issue, continuing our journey of strengthening the knowledge and education, we have an interesting article on "Management of diabetes in playground" by Prof. P Raghupathy, which gives insights how a child can manage diabetes while enjoying and playing. Along with that we have an article by Dr Sanjay Kalra which explains how right growth is an important indicator of good metabolic control and the role of right nutrition for it. We get a close view of life of a child with type 1 diabetes by a story from the IID CDiC center by Dr P K Jabbar. In the end , we have an article emphasizing on "Prevention is always better than cure" as how to "prevent acute complications for children with type 1 diabetes" by Dr A K Das. In the last page, we have BMI chart to know how healthy we are as an individual and about our requirement to follow a healthy lifestyle.

We look forward to your valuable feedback and suggestions. This is your magazine, so please do send in your feedback and contributions.

With best wishes.

Editorial Team

Managing Diabetes in Playground - Dr P. Raghupathy

Physical exercise is essential for everyone including children. Exercise provides a child an improved sense of well being, teaches discipline and helps in leading a normal childhood. In addition, exercise limits the rise of blood glucose after meals and helps in weight control. Exercise also aids in keeping heart rate, blood pressure and lipid levels in the healthy normal range.

Different forms of physical activity in a person with type 1 diabetes may have differing effects. It is important to understand impact of physical activity on diabetes and plan the exercise session accordingly so that a child with diabetes can be safe before, during and after exercise.

Effect of activity on type 1 diabetes

Hypoglycaemia

- Any aerobic activity like walking, running, swimming, cycling or playing games can result in low blood sugar level both during and after the exercise.
- Hypoglycaemia is more likely to happen if the activity is prolonged and intense.
- The most likely time of hypoglycaemia is 1 to 3 hours after an injection of short acting insulin.
- Hypoglycaemia is more likely to occur if the insulin injection is given near the active muscle to be used while exercising, e.g., like thigh before a football match. Abdominal wall is a good site for injection before running or playing.
- No food or less food intake prior to any activity can increase the risk of developing hypoglycaemia.
- Late hypoglycaemia after many hours may also occur (e.g. early morning hypoglycaemia after an evening of intense exercise). This is due to the blood glucose being slowly diverted to the muscles which have exhausted their glycogen stores during the exercise.

Hyperglycaemia

- Activities like sprinting or weight lifting and short periods of any intense activity can cause an increase in blood glucose levels due to release of hormones like adrenaline and glucagon.
- Less quantity of insulin and excessive food intake can also result in hyperglycaemia.
- Stress of any activity can result in immediate hyperglycaemia and subsequently hypoglycaemia, some hours later

Diabetic ketoacidosis

Exercising when blood glucose levels are continuously high and while circulating insulin level is low, may result in diabetic ketoacidosis. Diabetic ketoacidosis can be life threatening if not treated on time.

Essential tips to manage diabetes and have full benefits of exercise

1. If blood glucose monitoring is not possible frequently, then the child should be encouraged to participate in daily activities with lower intensity.
2. Ideally the child or person should monitor their blood glucose values before participating in any physical activity.
3. Exercise should be avoided when blood sugar is low. Child need not exercise when sugars are very high or when ketones are positive in blood and urine.
4. Physical activity should also be limited or avoided if there is an acute illness, or there is inadequate food or water intake during the activity or afterwards.
5. Any activity should allow eating a snack like an apple or 2 biscuits every 30 minutes during the exercise.
6. The child should always carry an eatable like a hard candy or juice, handy enough for use during an emergency of a low blood sugar.
7. After prolonged activity, the child should have an additional snack like biscuits with milk or a scoop of ice-cream (containing fat or protein) to prevent later hypoglycaemia.
8. It is good to drink plenty of water before, during and after exercising.
9. Child should wear proper shoes and socks that fit well and are comfortable during exercise. This is to prevent any kind of foot injury.
10. Ensure that the child with diabetes should always carry their diabetes identification card while going outside or for exercise, even in their own neighborhoods.

*http://integrateddiabetes.com/athletes-with-type-1-diabetes/

Do you know about them? List of sportsperson *with Type 1 Diabetes

Wasim Akram (Former Cricketer - Pakistan), Doug Burns (Mr California '97, subsequent Mr. Universe), Bobby Clark (former hockey player, Phila Flyers), Pamela Fernandes (Olympic Gold Medal cyclist), Missy Foy (Olympic Ultra Marathoner), Kris Freeman (Olympic Skier, silver medalist), Gary Hall, Jr. (Olympic swimmer/gold medalist), Tom Hallion (Major League Umpire), Mark Lyle (professional golfer), Steve Redgrave (Olympic rowing gold medalist)

Right Nutrition for right growth - Dr Sanjay Kalra

– Right of every child with type 1 diabetes

Growth and development are important indicators for any child's overall health. Treatment goals for children with diabetes is to minimize symptoms, prevent short- and long-term complications and help them to have normal physical, mental, emotional, and social growth and development.

Nutritional needs of a child with type 1 diabetes are similar to any other child. Optimal management of diabetes in children and adolescents includes a balanced intake of food supplying adequate energy, protein and all nutrients to maintain growth and development; two to four injections of insulin per day and monitoring of blood glucose levels along with regular physical activity for ensuring good blood glucose control.

In general, Children with type 1 diabetes need to:

- take insulin as prescribed
- eat a healthy, balanced diet, paying special attention to the amount of carbohydrates in each meal
- check blood sugar levels several times a day
- get regular physical activity

How to know about child's growth

Every child needs to be evaluated for height, weight and BMI.[1] Height and weight should be plotted on paediatric growth charts on a regular basis to understand growth and growth velocity. Good metabolic control is essential for normal growth and development.[2] Normal height and appropriate weight gain throughout childhood and adolescence are excellent indexes of health in general and reasonable markers of good metabolic control of diabetes in particular. Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m^2).[3] Whatever assessment is done, it should be sensitive to cultural, socio-economic and environmental determinants in order to develop a realistic and comprehensive individualized management plan. Generally height issues do not affect children with type 1 diabetes as such, and are generally indicators of poor metabolic control or other concomitant illness. Weight issues can affect children and teens who have type 1 diabetes. Being overweight or being underweight is not good for any one. For children with type 1 diabetes, it is more important as weight can influence diabetes and diabetes can influence weight.

Being under weight and Type 1 Diabetes

Most of the children when diagnosed with Type 1 diabetes are underweight. When undiagnosed or untreated, type 1 diabetes can make people lose weight despite having a normal or increased appetite. Once they're diagnosed and treated properly, their weight should return to normal. If the child with type 1 diabetes is underweight, then it indicates,

- Uncontrolled diabetes
- Concomitant illness like hyperthyroidism, celiac diseases
- If the child's glucose levels are controlled and there is no other problem, then it can be due to inappropriate calorie restricted diet.

Being overweight and Type 1 Diabetes

Overweight children with type 1 diabetes have trouble controlling their blood sugar levels as excess body fat can make it difficult for the body to use insulin properly, which is similar to having a condition called as insulin resistance found in people with type 2 diabetes.

Weight loss, eating healthier foods and controlling size of food portions and exercising can actually reverse insulin resistance. If the child with type 1 diabetes is overweight, then it indicates,

- Blood glucose level control only by insulin and no healthy eating and exercise.
- Concomitant illness like hypothyroidism

Sometimes growth disorders in the child with type 1 diabetes can be due to other concomitant autoimmune disorders also. These include thyroid diseases, celiac disease, adrenal insufficiency, alopecia areata, juvenile rheumatoid arthritis and some other less commonly associated autoimmune diseases. These disorders are not directly related to having diabetes but are there because of common genetic predisposition shared by these disorders.

Any autoimmune disorder present along with type 1 diabetes can result in either unexplained high or low blood glucose levels. Failure to recognize and treat these disorders can lead to worsening diabetes control, thus affecting overall well-being and growth.

Maintaining a healthy weight

Maintaining a healthy weight can be a challenge for some children with diabetes. Here are some common problems to watch for;

- Child or parents are so fearful of insulin that they are missing insulin or giving less dose of insulin which can cause child to be underweight
- Some children with diabetes eat too many snacks because they or their parents are very fearful of hypoglycaemia (low blood sugar). This can lead the child to be overweight.
- Children are allowed to have sweets or candy with dose adjustment occasionally. Parents or children may take higher doses of insulin with large quantity of sweets. This cycle can lead to excessive weight gain.

Ultimate goal for treatment

The goal of treatment is that children can reach and maintain a healthy height and weight. When children with diabetes reach and maintain a healthy physique, they feel better and have more energy and they find management of diabetes to be easier.

1. http://care.diabetesjournals.org/content/28/1/186.full
2. Wise JE, Kolb EL, Sauder SE: Effect of glycemic control on growth velocity in children with IDDM. Diabetes Care 15:826–830, 1992
3. http://apps.who.int/bmi/index.jsp?introPage=intro_3.html

Life story of Beena* - Dr P K Jabbar

(Age - 16 years, living with type 1 diabetes for 4 years)

Beena is under the care of Dr. P K Jabbar (IID, CDiC centre, Trivandrum). This story is narrated by her father to him.

Brief Background:

Beena was born in a very economically poor family, Her father worked as a daily waged, unskilled worker having no fixed monthly income. Her mother is a house wife. Beena has one more sister. They live in a small rented house. However Beena and her family were contented in their life.

When and how the family came to know about Beena's type 1 Diabetes

Beena was diagnosed to have type 1 diabetes, when she was 12. One morning, as usual she left home for attending the school and was waiting in the bus stop for catching the bus. She collapsed there and the people around her took her to the nearest hospital. The investigations done there showed her blood glucose level above 400. She was then referred to the SAT Hospital where she was treated in the ICU for 6 days and thereafter in the general ward for 26 days. It was a great shock and trauma for the family. This was the first time when they came to know about diabetes. This news saddened the entire family.

Issues and beliefs

The bitter truth was hard to accept for her family and the expenses were huge. Initially her family thought that these injections and monitoring were only for month or two. For the daily insulin and blood test of Beena, they needed Rs. 3000/- per month. In addition to this, nearly Rs. 1500/- was required every month for doctor consultation and further investigations. It was extremely difficult to make both ends meet for them. They had to stop monitoring at home and even the minimum medical support required for Beena was becoming impossible. Family decided to take Beena out of school, so that some money could be saved for her treatment.

Journey of living and learning to manage diabetes

They were struggling to make both ends meet. In November 2013, they read in a local newspaper (Mathrubhumi), that in the Indian Institute of Diabetes, Pulayanarkotta, Thiruvananthapuram there is a special project under which children with diabetes below the age of 18 years belonging to BPL family are given free diabetes care, with the support of the CDiC program. They visited to Indian Institute of Diabetes where Beena was registered under the CDiC scheme. Their economic worries reduced considerably after coming here. In the words of her father," Now we are getting good medical care from Indian Institute of Diabetes free of cost. We are also given sufficient glucometer strips, glucometer & syringe and Insulin for our everyday use. Frequent medical checkups, timely medicine and the confidence obtained by attending the counselling sessions and awareness classes in Indian Institute of Diabetes gave us a new life and also to Beena.

Beena rejoined school after coming to IID. In addition, last year she was one of the children who was selected for scholarship of Rs. 10,000/- from CDiC, as she is good in studies, regular in her visit to CDiC center and also in management of diabetes.

She is a confidant 16 year old who wants to become nurse one day.

*Please note that name and few specifications of the child are changed to keep the identity of child confidential.

FAQ

Q1 What can be done to prevent type 1 diabetes in children?

It is always difficult to explain why type 1 diabetes occurred in any child. There is nothing parents could have done to prevent type 1 diabetes in their child . Although scientists think that it has something to do with genes or exposure to something like a virus , but still it is not confirmed.

Even if there is a family member with type 1 diabetes, there's no reliable way to predict who can and will get type 1 diabetes.

It is a confirmed fact that type 1 diabetes is not contagious and eating too much sugar does not result in type 1 diabetes.

Q2 Does one need to monitor blood sugar levels even when they are feeling fine?

Monitoring blood sugar levels with a home blood glucose meter is an important pillar of managing diabetes. Even if one is feeling fine, it is not a guarantee for blood sugar levels to be in the target range. It is essential to understand that symptoms of high blood sugar levels do not appear very clearly and occur only when the sugars are constantly elevated for longer periods of time.

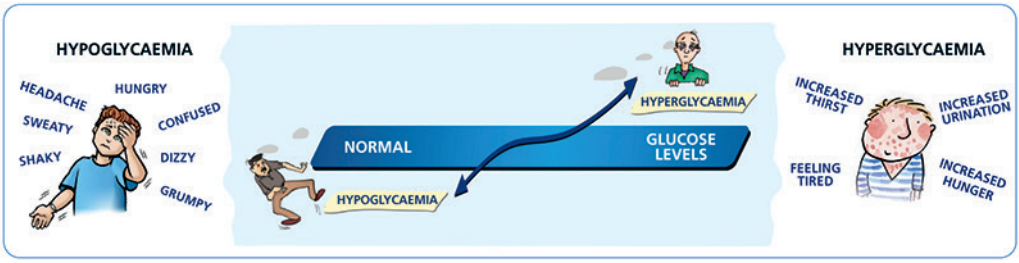
Complications of uncontrolled diabetes may happen even when the blood sugar is only slightly elevated. Regular blood sugar monitoring can help you keep your blood sugars in control and prevent serious damage to your eyes, kidneys and nerves. Ask your doctor about your goals of blood sugar levels.

Q3 If due to any reason, one takes their insulin injection twice by mistake. What should he/she do?

Seek medical attention urgently in the case of an insulin overdose.

Mistakes do happen, but this mistake can be slightly risky. Taking too much insulin can lead to hypoglycaemia or low blood sugar levels. This can become particularly serious if insulin dose was significantly more than it should have been. It also depends upon, which insulin, you have taken twice. If it is short acting insulin, the effect can remain upto 8 hours and if it is long acting insulin, the effect can remain upto 24 hours.

- As soon as one realizes that one had overdosed on insulin, **it is essential to take simple fast-acting carbohydrate like glucose or sugary drink immediately,** followed by slow acting carbohydrate like fruit or bread and seek advice from health team.
- One needs to check blood sugar levels every 1 - 1.5 hours and eat or drink accordingly after that.
- It is common to need 10-15gm of carbohydrate to counteract each unit of insulin. It's generally safer to have too much than too little carbohydrate when treating an overdose of insulin. Avoid having fatty foods, if possible, as fat tends to slow down how quickly the carbohydrate acts.
- One may need to adjust dose of short acting insulin for the full day next day, if by mistake long acting insulin is taken twice.



Prevention of acute complications in children with type 1 diabetes - Dr A K Das

Diagnosis of type 1 diabetes means that the child or a person with type 1 diabetes does not produce any insulin and requires insulin injections for survival and living. Type 1 diabetes is associated with generally two acute complications i.e hypoglycaemia and diabetic ketoacidosis. These can be prevented by education, monitoring and timely action.

Let us try to understand

Hypoglycemia[1] is a condition characterized by abnormally low blood glucose, usually less than 70 mg/dL.

Hypoglycaemia should be considered[1] when there are the following signs and symptoms: shakiness/ nervousness/anxiety; sweating, chills and clamminess; irritability or impatience; confusion (including delirium); rapid/fast heart beat; light-headedness or dizziness; hunger or nausea; sleepiness; blurred/impaired vision; tingling or numbness in the lips or tongues; headache; weakness/fatigue; anger; stubbornness or sadness; lack of coordination; nightmares or crying out during sleep. If not treated on time, it can lead to seizures or unconsciousness

Prevention

To prevent hypoglycaemia, it is essential for people with diabetes

- Not to skip or delay meals or snacks.
- Take consistent quantity of food especially in terms of carbohydrates
- Measure insulin and medication carefully, and take it on time. Take your medication as recommended by your doctor. While taking insulin match the syringe with your insulin. Eg. IU 40 insulin and IU 40 Syringe
- Monitor blood sugar regularly and frequently when ever there is change in routine or food.
- If there is an increase in physical activity, it needs to adjusted by 1or 2 less units of insulin or by having additional snacks. The adjustment depends on the blood sugar test results and on the type and length of the activity.
- Eating a meal or snack with alcohol, if one chooses to drink. Drinking alcohol on an empty stomach can cause hypoglycemia.
- Record your blood sugar levels and also low glucose reactions. This can help you and your health care team see patterns of hypoglycemia and reasons contributing to hypoglycaemia and thus find ways to prevent them.
- By carrying everywhere a snack to eat to prevent and some glucose, sugar or juice to treat hypoglycaemia.
- It is good to carry some form of diabetes identification so that in an emergency others will know that you have diabetes and help you.

Treatment

Most people with diabetes can easily treat hypoglycaemia by consuming 15-20 grams of glucose[1] or simple carbohydrates like 2-3 hard candy, ½ cup juice. It is good to recheck your blood glucose after 15 minutes. If hypoglycemia continues, repeat. Once blood glucose returns to normal, eat a small snack if your next planned meal or snack is more than an hour or two away.

Diabetic Ketoacidosis[2] DKA occurs when there is no insulin or insulin action is insufficient. It is most commonly seen at time of diagnosis, with acute illness or if insufficient insulin has been administered. DKA if not treated, can lead to coma and death.

Causes of DKA

- Lack of insulin/ Too little insulin
- Blood glucose level high
- Loss of electrolytes in urine
- Ketones in blood and urine
- Infection

Consider possibility of DKA: When there is a child with following signs and symptoms

- High blood glucose (lab or glucometer) or urine glucose
- High urine ketones / Serum ketones
- Thirsty with sunken eyes, dry mouth, decreased skin turgor
- Sweet smelling breath
- Acidotic breathing
- Nausea, vomiting, abdominal pain
- Irritability, altered level of consciousness

Strategies to Prevent Diabetic Ketoacidosis

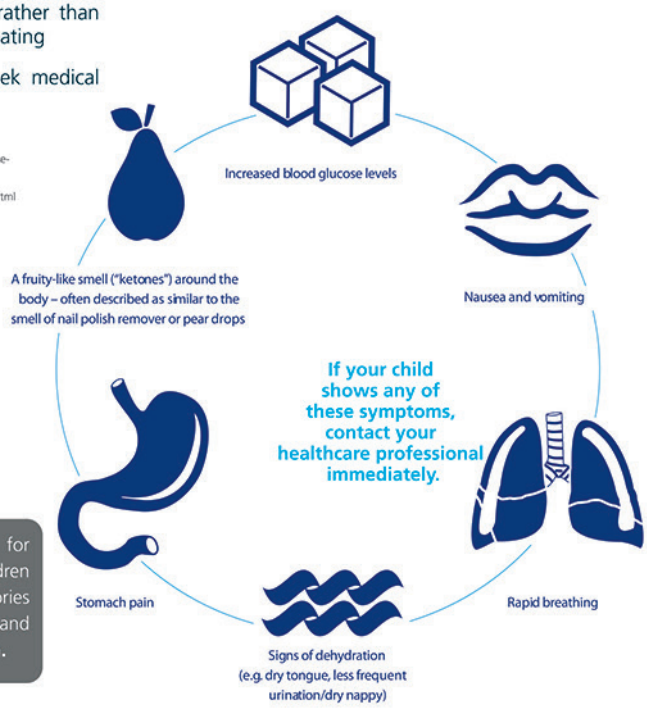
- Appropriate and regular diabetes education for management of diabetes at home especially on sick day management.
- Regular home blood glucose monitoring and more frequent monitoring when sick; every 3-4 hours.
- Learning about insulin dose adjustment from doctor. Taking supplemental short-acting insulin regimens when blood sugar levels are high
- Monitoring of urine ketones at home when sick and when sugars are continuously above 240mg/dL for a day.
- Easily digestible liquid diets when sick
- Staying hydrated by drinking extra liquids (low calorie) when having high blood sugar levels
- Never skipping insulin dose. Reducing, rather than eliminating, insulin when patients are not eating
- Guidelines for when patients should seek medical attention

1. http://www.diabetes.org/living-with-diabetes/treatment-and-care/blood-glucose-control/hypoglycemia-low-blood.html accessed on 28th July.

2. http://www.diabetes.org/living-with-diabetes/complications/ketoacidosis-dka.html

It's also important to know when to seek help and visit hospital. Child must visit hospital if:

- The child/person with diabetes is confused or his/her general well-being is affected
- Is having large or repeated vomiting
- Having Increasing levels of ketones or laboured breathing
- Continued high BG level > 240 mg/dl despite extra insulin
- Unable to keep BG > 70 mg/dL
- The underlying condition is unclear
- There is severe or unusual abdominal pain



We thank everyone for their kind efforts for implementation of Changing Diabetes in Children program. Please write to us about your views, stories and ideas which can add value to this program and the guardian at **CDICINDIA@novonordisk.com.**

Stay fit with healthy weight

Body Mass Index (BMI) is a reliable calculator to evaluate and know whether a person is having healthy weight/ underweight / overweight / or obese. It is a ratio calculated from weight and height.

Metric BMI Formula

BMI[1] = (Weight in kilograms / (height in meters x height in meters)

If you are overweight (with a BMI over 25) and physically inactive, you may develop:

- Type 2 diabetes.
- Cardiovascular (heart and blood circulation) disease.
- Gallbladder disease.
- High blood pressure (hypertension)
- Osteoarthritis.
- Certain types of cancer, such as colon and breast cancer

Diabetes is difficult to manage in people with high BMI

HEIGHT		BODY WEIGHT (kg)															
ft. in	cm	50	54	58	62	66	70	74	78	82	86	90	94	98	102	106	110
4.7	140	25.5	27.6	29.6	31.6	33.7	35.7	37.8	39.8	41.8	43.9	45.9	48.0	50.0	52.0	54.1	56.1
4.9	144	24.1	26.0	28.0	29.9	31.8	33.8	35.7	37.6	39.5	41.5	43.4	45.3	47.3	49.2	51.1	53.0
4.10	148	22.8	24.7	26.5	28.3	30.1	32.0	33.8	35.6	37.4	39.3	41.1	42.9	44.7	46.6	48.4	50.2
4.12	152	21.6	23.4	25.1	26.8	28.6	30.3	32.0	33.8	35.5	37.2	39.0	407	42.4	44.1	45.9	47.6
5.1	156	20.5	22.2	23.8	25.5	27.1	28.8	30.4	32.1	33.7	35.3	37.0	38.6	40.3	41.9	43.6	45.2
5.3	160	19.5	21.1	22.7	24.2	25.8	27.3	28.9	30.5	32.0	33.6	35.2	36.7	38.3	39.8	41.4	43.0
5.5	164	18.6	20.1	21.6	23.1	24.5	26.0	27.5	29.0	30.5	32.0	33.5	24.9	36.4	37.9	39.4	40.9
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5.8	172	16.9	18.3	19.6	21.0	22.3	23.7	25.0	26.4	27.7	29.1	30.4	31.8	33.1	34.5	35.8	37.2
5.9	176	16.1	17.4	18.7	20.0	21.3	22.6	23.9	25.2	26.5	27.8	29.1	30.3	31.6	32.9	34.2	35.5
5.11	180	15.4	16.7	17.9	19.1	20.4	21.6	22.8	24.1	25.3	26.5	27.8	29.0	30.2	31.5	32.7	34.0
6.0	184	14.8	15.9	17.1	18.3	19.5	20.7	21.9	23.0	24.2	25.4	26.6	27.8	28.9	30.1	31.3	32.5
6.2	188	14.1	15.3	16.4	17.5	18.7	19.8	20.9	22.1	23.2	24.3	25.5	26.6	27.7	28.9	30.0	31.1
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6.7	200	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5	24.5	25.5	26.5	27.5
6.8	204	12.0	13.0	13.9	14.9	15.9	16.8	17.8	18.7	19.7	20.7	21.6	22.6	23.5	24.5	25.5	26.4
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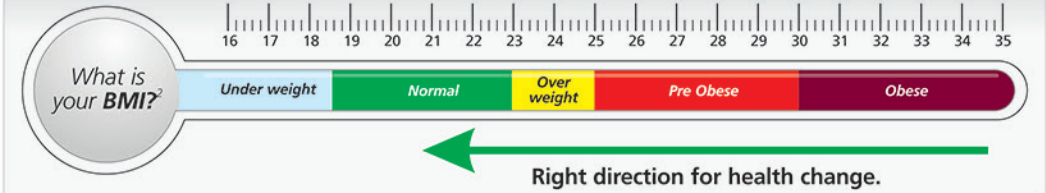
7.3	220	10.3	11.2	12.0	12.8	13.6	14.5	15.3	16.1	16.9	17.8	18.6	19.4	20.2	21.1	21.9	22.7



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1. http://apps.who.int/bmi/index.jsp?introPage=intro_3.html, accessed on 13 April 2016. 2. http://japi.org/february_2009/R-1.pdf, accessed on 14 April 2016

changing diabetes® in children

ISPAD International Society for Pediatric and Adolescent Diabetes

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