

## Chapter 14

# Diabetes and Blood Sugar Control



People with diabetes whose blood sugars are mostly in the desired range for age are said to be in “good sugar control” (blood sugar is the same thing as blood glucose). Goals for blood sugars are given in this chapter and Chapter 7.

### SUGAR CONTROL:

- is measured day to day by checking blood sugar levels on a meter (or, more recently, by a continuous glucose monitor [CGM]).
- is also measured by a very important test called the hemoglobin A<sub>1c</sub> test (**HbA<sub>1c</sub>** or **A<sub>1c</sub>**).

#### The HbA<sub>1c</sub> test:

- can be thought of as the “forest” and the blood sugars as the “trees”
- tells how often the sugars have been high for every second of the day for the past 90 days

- should be done every three months
- should be in the desired range (see table for a person to be in “good sugar control.”)

### WHY IS GOOD SUGAR CONTROL IMPORTANT?

#### Good Sugar Control (lower HbA<sub>1c</sub> values):

- 1 helps people feel better.
- 2 can lessen the risk for the eye, kidney, nerve and heart problems from diabetes. This was proven by The **DCCT** (Diabetes Control and Complications Trial).
- 3 helps to lower blood fats (cholesterol and triglyceride levels; see Chapter 11).
- 4 helps children grow to their full adult height.

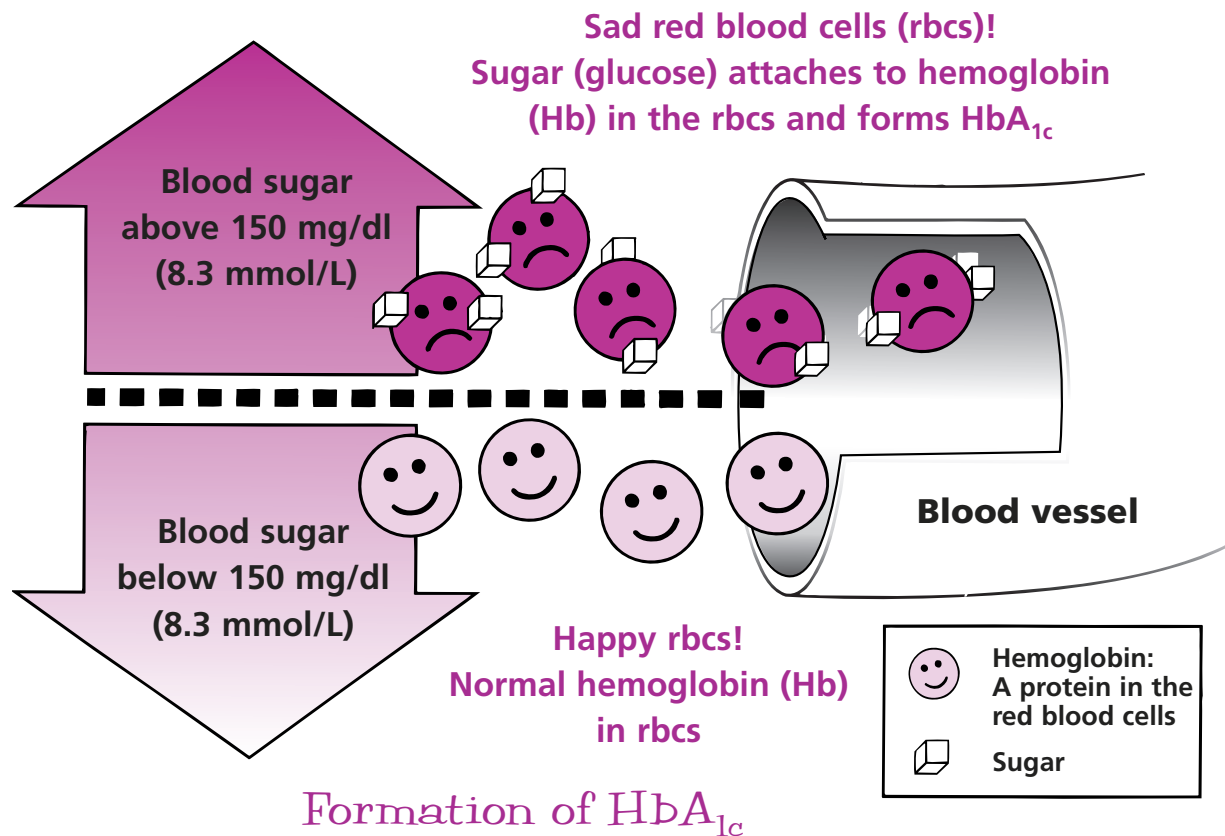
Table

## Normal Ranges and Goals for HbA<sub>1c</sub> and Blood Sugar Values

	HbA <sub>1c</sub> *	Blood Sugar**
<b>Normal values (non-diabetic):</b>	4.3-6.2%	70-120 (3.9-6.7)
<b>Goals for someone with diabetes:</b>		
19 years or older	less than 7%	70-140 (3.9-7.8)
13-19 years	less than 7.5%	70-150 (3.9-8.3)
6-12 years	less than 8%	70-180 (3.9-10.0)
under six years old	7.5%-8.5%	80-200 (4.5-11.1)

\*Some care providers are now suggesting all children should aim for an HbA<sub>1c</sub> below 8%, and adults should aim for a level below 7%.

\*\*Blood sugar values are given in mg/dl with the mmol/L in parentheses. These levels should be the goal for both fasting (e.g., AM) and two hours after meals.



Four of the major influences on blood sugar control.

All four must be in balance for the best sugar control. Blood sugar control is measured by daily blood sugar levels and by Hemoglobin A<sub>1c</sub> (HbA<sub>1c</sub>) levels done every three months.

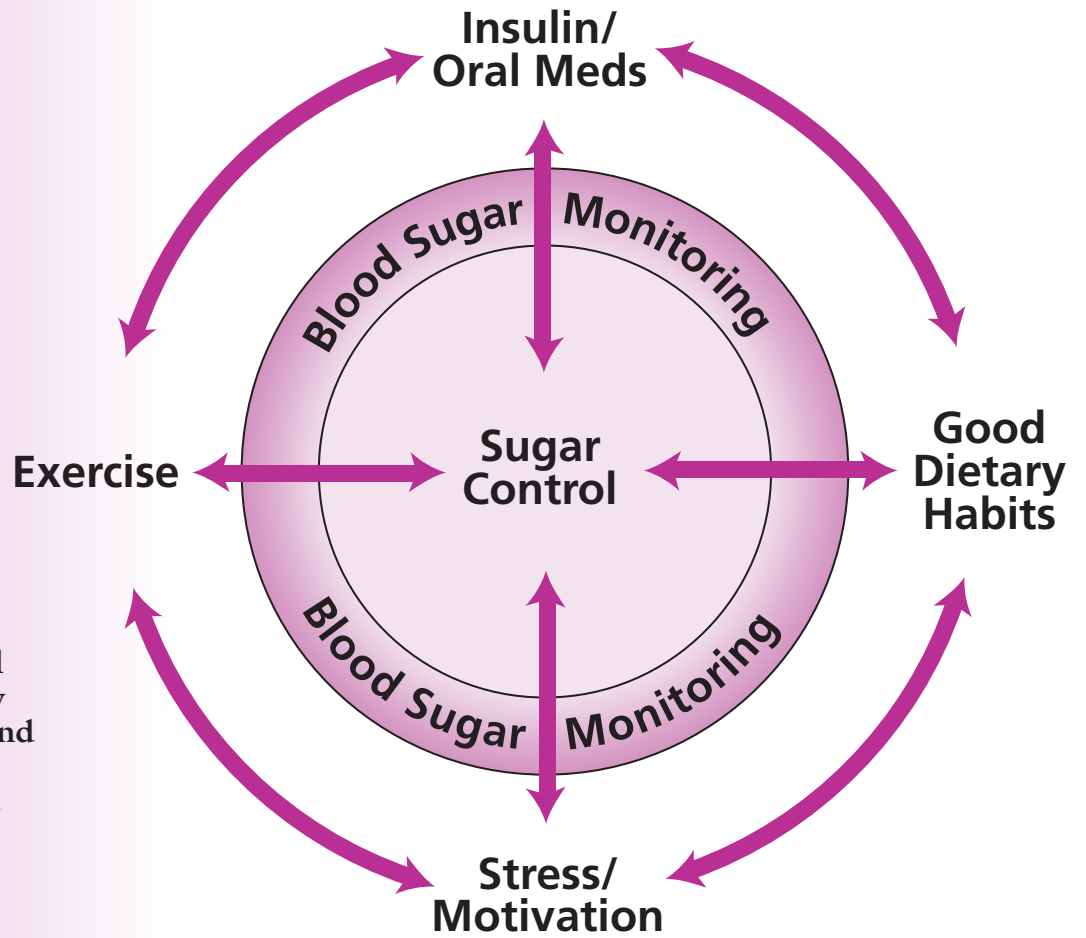


Table  
**The Two Emergencies of Diabetes**

Low Blood Sugar (Chapter 6) (Hypoglycemia or Insulin Reaction)	Ketoacidosis (Chapter 15) (Acidosis or DKA)
<b>Due to:</b> Low blood sugar	Presence of ketones
<b>Time of onset:</b> Fast – within seconds	Slow – in hours or days
<b>Causes:</b> Too little food Too much insulin Too much exercise without food Missing or being late for meals/snacks Excitement in young children	Too little insulin Not giving insulin Infections/Illness Traumatic body stress Pump insertions malfunctioning
<b>Blood sugar:</b> Low (below 60 mg/dl or 3.3 mmol/L)	Usually high (over 240 mg/dl or 13.3 mmol/L)
<b>Ketones:</b> Usually none in the urine or blood	Usually moderate/large in the urine or blood ketones over 0.6 mmol/L.
<b>Mild:</b> <b>SYMPTOMS</b> Hunger, shaky, sweaty, nervous	<b>SYMPTOMS</b> Thirst, frequent urination, sweet breath, small or moderate urine ketones or blood ketones less than 1.0 mmol/L.
<b>Moderate:</b> Headache, unexpected behavior changes, impaired or double vision, confusion, drowsiness, weakness or difficulty talking.	<b>TREATMENT</b> Give lots of fluids and Humalog/NovoLog/Apidra or Regular insulin every two or three hours.
<b>Severe:</b> Loss of consciousness or seizures.	Continued contact with healthcare provider. Give lots of fluids. Give Humalog/NovoLog/Apidra or Regular insulin every two or three hours. Give Phenergan medication (suppository or topical cream) if vomiting occurs.
	<b>TREATMENT</b> Give lots of fluids and Humalog/NovoLog/Apidra or Regular insulin every two or three hours.
	Continued contact with healthcare provider. Give lots of fluids. Give Humalog/NovoLog/Apidra or Regular insulin every two or three hours. Give Phenergan medication (suppository or topical cream) if vomiting occurs.
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