DIABETIPS FOR DIABETICS

World Diabetes Day is celebrated on November 14th, however, such an important topic deserves to be observed for the entire month. The TTOA has embarked on promoting Diabetes awareness for the entire month of November as we prepare to enter this Yuletide Season where so many of us may be tempted to over indulge in our favorite food and beverages.

DIABETES MELLITUS DEFINITION:

Diabetes Mellitus is a group of metabolic diseases characterized by hyperglycemia result from defects in:

- *Insulin secretion*
- *Insulin action*
- *Bother secretion and action*

CHARACTERISTICS OF TYPE 1 AND TYPE 2

TYPE 1 (Insulin Dependent)	TYPE 2 (Non-insulin Dependent)
• acute onset • Insulin essential • Typical onset in young • Usually non-obese • 50% concordance with identical twins • Family History 10%	• Insidious onset • Diet or tablet control • Onset usually 50 years and over • Often obese • Nearly 100% concordance with identical twins • Family history 30 %

EPIDEMIOLOGY & GLOBAL BURDEN OF DIABETES:

- The World Health Organization (WHO) estimated that there are 422 million adults with diabetes worldwide in 2014. This figure is increasing and it is estimated that by 2045 there will be at least 629 million people living with diabetes worldwide
- Type 2 Diabetes accounts for between 90-95% of diabetes with highest proportions in low and middle income countries
- High blood glucose cause 4 million deaths each year
- Prevalence in adults rose from 4.7% in 1980 to 8.5% in 2014
- In Trinidad there are more than 200, 000 persons living with diabetes, 1/3 of which are children.

WHO SHOULD BE TESTED?

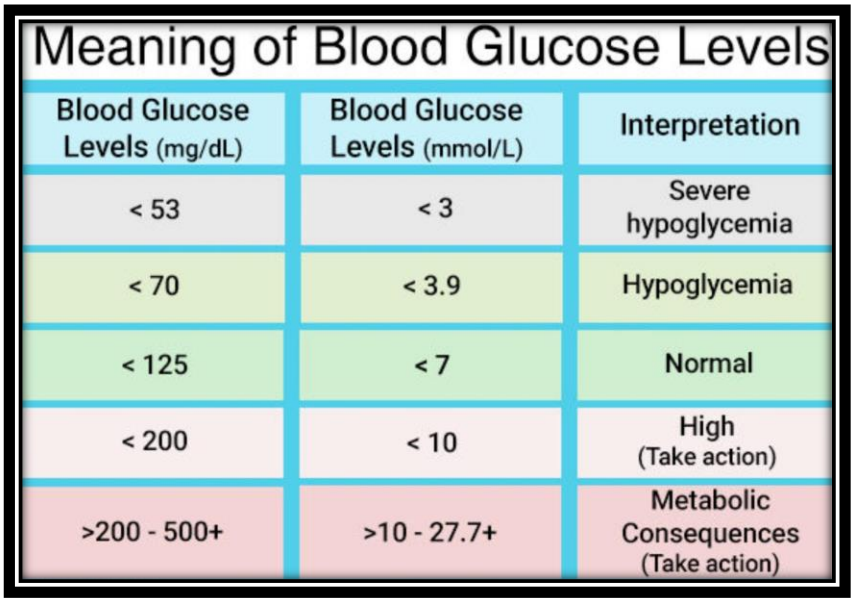
- Age 45 years and older should test yearly
- Test at a young age or more frequent in

  -obese (BMI 27)

  - first degree relatives with diabetes
  - high risk ethnic populations (e.g. African, Hispanic)
  - women who have a baby weighing > 9 lbs. at birth or have been diagnosed with Gestational Diabetes Mellitus
  - hypertensive (Blood Pressure of 140/90 or above)

CRITERIA FOR DIAGNOSIS

- Elevated plasma glucose level of 200 mg/dL or 11.1mmol/l or above and symptoms of diabetes:
  - polyuria (excessive passage of urine)
  - polydipsia (excessive thirst)
  - weight loss
- Fasting plasma glucose of 7.0 mmol/l (126 mg/dL) or more.
- Oral glucose tolerance test- a 2-hour plasma glucose of 11.1 mmol/l or more.



Meaning of Blood Glucose Levels

Blood Glucose Levels (mg/dL)	Blood Glucose Levels (mmol/L)	Interpretation
< 53	< 3	Severe hypoglycemia
< 70	< 3.9	Hypoglycemia
< 125	< 7	Normal
< 200	< 10	High (Take action)
>200 - 500+	>10 - 27.7+	Metabolic Consequences (Take action)

OCULAR COMPLICATIONS OF DIABETES

1. **Diabetic Retinopathy:** is the most common cause of blindness in the working population. It is a microangiopathy affecting all the small vessels such as arteries, capillaries and venules. It is characterized by increased vascular permeability, ocular hemorrhages, lipid exudates and new vessels on the retina and posterior vitreous surface. It can be managed via laser treatment and Intravitreal medication, just to name a few.

Figure1: Illustration of normal vision compared to the vision of a patient with diabetic Retinopathy

2. **Disorders of the Eyelid**: due to poor resistance to infections, that is, recurrent styles or blepharitis or chalazion.

3. **Conjunctiva**: Recurrent subconjunctival haemorrhage or burst blood vessels on the conjunctiva. Therefore one should check blood pressure and blood sugar levels.

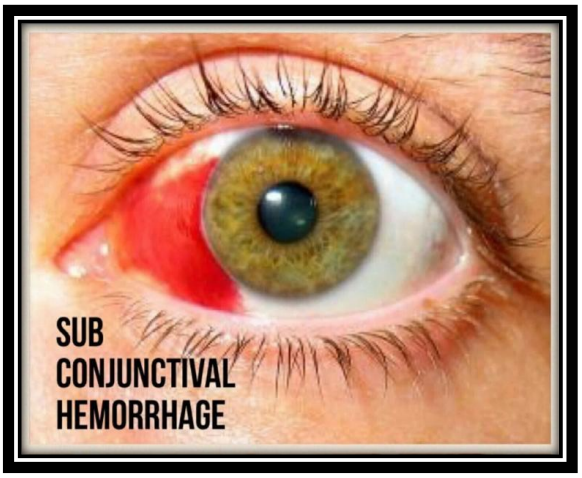


Figure 2

4. **Extraocular Muscle Palsies:** This is mostly a third nerve palsy where one eye is straight and the other is down and out. Whilst the pupil of the affected eye may be spared and appears normal, in other cases it may be dilated. This classically occurs in older patients with diabetes Mellitus.

5. **Disorders of the cornea:**
    - **a.** Recurrent epithelial erosion. Your Optometrist will see punctuate staining when your Optometrist performs the staining or “dye test".
    - **b.** Transient punctuate keratitis
    - **c.** Stromal Oedema
    - **d.** Reduced corneal sensitivity: The nerves loose feeling. (Feeling may also be lost in fingers and feet)
    - **e.** Reduced resistance to infection.
    - **f.** Reduced healing rate

6. Disorders of the Crystalline Lens:

- CATARACTS

1. Reversible Snowflake Cataract: Classically in type 1 patients in the early stages. It may resolve spontaneously or mature within a few days. It is reversible with good metabolic control.

Figure 3: Illustration of a Snow-flake cataract

2. Cortical Cataract: This is an age-related cataract (usually occurs >65) which occurs earlier in diabetics (in early 40s)

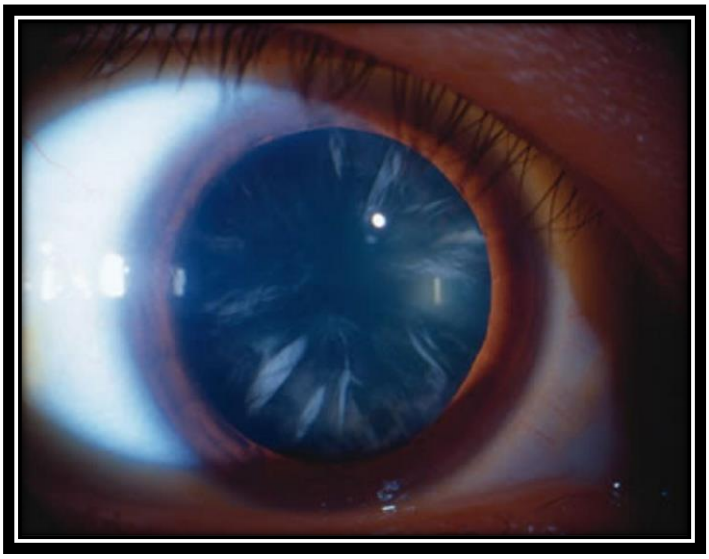
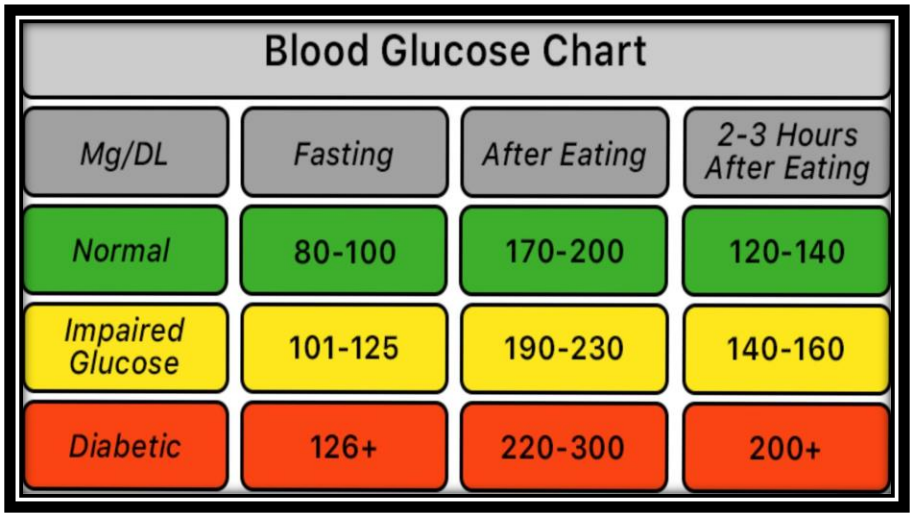


Figure 4: Illustration of a Cortical Cataract

- FLUCTUATIONS IN PRESCRIPTION due to changes to hydration in lens:
    1. Classically myopic shifts: A patient can have as much as a -3 Dioptre shift in prescription. By this we mean that a patient have a +1.00 Dioptre prescription this week which may change to -2.00 Dioptre prescription over the next couple weeks

    2. Transient hyperopia usually occurs after strict metabolic control. That is, the prescription may go from -2.00 Dioptres to +1.00 Dioptres. The blood sugar level tends to be low in these patients.

It is important to ensure that our diabetic patients have stable vision. This is the reason why good glycemic control before refracting and prescribing both spectacles and /or contact lenses is crucial. As a result, we usually advise patients to check their Blood Sugar Levels frequently. It has been advised that Type 1 diabetics should check their BSL a few times per day and Type 2 Diabetics check their Blood Sugar Level at least once per day. The table below provides a brief idea of blood sugar level ranges as it relates to eating.



WHAT WE HEAR & WHAT WE ADVISE

Optometrists are often told:

- "I checked my blood sugar level last week or last month and it was fine." Ideally diabetics should check you blood sugar level on the day of your eye test, either fasting (first thing when you wake up in the morning) or two hours after eating.

- "I stopped checking my blood sugar level because the strips are too costly." Contact the Diabetes Association of Trinidad and Tobago get more information about how to obtain free strips or to purchase them at a reduced cost.

- "I stopped taking my medication because last month when I checked my blood sugar level it was good, so I am no longer diabetic." Even though your blood sugar level was good you still need to use you medications so it will stay within the normal range.

- "The diabetes medication makes me feel sick so I stopped using it." We are aware that there are side effects to most medications, please see your Doctor to discuss alternative medications before cessation.

- "When I did my eye exam 5 years ago you said that my vision was fine. That is why I did not return." Once you are diabetic you should have a routine eye exam yearly and also see your Ophthalmologist for a diabetic screening yearly. Contact the Diabetes Association of Trinidad and Tobago for more information about free diabetic eye screening.

REFERENCES:

- Nihat, S et al. (2015) Ocular Complications of Diabetes Mellitus. World Journal of Diabetes 6(1):92-108
- Classification of Diabetes Mellitus. Geneva: World Health Organization; 2019. Licence: CC BY-NC-SA 3.0 IGO https://www.who.int/health-topics/diabetes

ABOUT THE AUTHOR