



SNS COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

Approved by AICTE & Affiliated to Anna University
Accredited by NBA & Accredited by NAAC with 'A++' Grade,
Recognized by UGC Saravanampatti (post), Coimbatore-641035.



Department of Biomedical Engineering

Course Name: 19BM0302 & WEARABLE TECHNOLOGIES

Topic :Optical Glucose Sensor

Semester :6

19BM0302/ Optical Glucose Sensor /Dr.S.Prince Samuel /AP/BME



INTRODUCTION TO DIABETES



A metabolic disease in which the body's inability to produce any or enough insulin causes elevated levels of glucose in the blood."

Blood Sugar Classification	Fasting Blood Sugar Levels	Post Meal Blood Sugar Levels
Normal	70-100 mg/dL	70-140 mg/dL
Prediabetes	101-125 mg/dL	141-200 mg/dL
Diabetes	125 mg/dL and above	200 mg/dL and above

Vision Title 3



TYPES OF DIABETES



- Type 1
- Type 2
- Gestational diabetes
- Prediabetes

Vision Tit 2

Vision Title 3



TYPE 1 DIABETES

- Also known as juvenile diabetes
- Usually diagnosed in children and young adults
- When body's own immune system destroys the insulin producing cells of the pancreas – beta cells – which produce insulin
- Only 5% of people have this disease
- Body does not produce insulin
- Is not preventable
 - No primary intervention
- Causes?
 - Predisposition to diabetes – genetics - and something (i.e. weather, virus ... etc) in environment triggers the disease

Vision Title 3



TYPE 2 DIABETES

- Most common form of diabetes – about 90% of cases
- Used to be called adult onset, non insulin dependent diabetes
- Body produces insulin, but does not use it properly
 - glucose doesn't move into cells, they pile up in the bloodstream when they do occur are often ignored because they may not seem serious

TYPE 2

BODY CANNOT USE INSULIN PROPERLY

- Can develop at any age
- Most cases can be prevented

The infographic features a light blue background with a cluster of green puzzle pieces on the left. The text is in a clean, sans-serif font.



GESTATIONAL DIABETES MELLITUS



- Having diabetes during pregnancy
 - Family Hx of diabetes, overweight prior to pregnancy?
- Having gestational diabetes puts you at risk for diabetes type 2
- Giving birth to a baby >9 lbs also puts you at risk for type 2
- 18 out of every 100 pregnant females will develop GDM

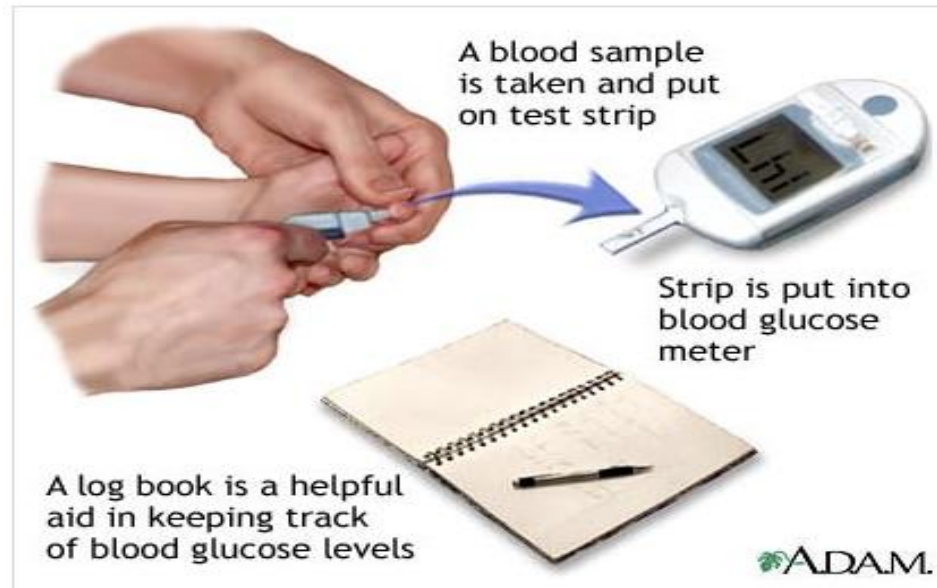
Vision Title 3

19BM0302/ Optical Glucose Sensor /Dr.S.Prince Samuel /AP/BME



GLUCOSE SENSOR

A Glucose sensor is designed to automatically measure interstitial sugar every few minutes, without any user intervention



Vision Title 3



WORKING OF OPTICAL GLUCOSE SENSOR



- The idea is that as the intensity of fluorescence varies, information is transmitted through radio waves by an implanted device equipped with both light source and photodetector.
- Then the waves would be received by another device worn outside the body and information regarding the individual's glucose level would trigger an alarm.
- Glucose Sensor uses a hydrogel, a polymer similar to contact lenses, that is permeable to glucose.
- A Fluorescent Chemical Compound is contained within a hydrogel polymer for stabilization inside the body.
- The Hydrogel has multiple functionalities as enzyme reservoir and a skin sensor and maintaining osmotic gradient for glucose extraction from the skin.



SYMPTOMS OF DIABETES & OPTICAL SENSOR



Common symptoms of diabetes include:

- Excessive thirst and appetite
- Increased urination (sometimes as often as every hour)
- Unusual weight loss or gain
- Fatigue
- Nausea, perhaps vomiting
- Blurred vision
- In women, frequent vaginal infections
- In men and women, yeast infections
- Dry mouth
- Slow-healing sores or cuts
- Itching skin, especially in the groin or vaginal area



A top-down photograph of a white card with the words "Thank you" written in purple, glittery cursive calligraphy. The card is placed on a light-colored, veined marble surface. To the left of the card is a bouquet of small purple flowers with green leaves. To the right of the card is a black pen with a white polka-dot grip. Further to the right is a small gift wrapped in white paper with a grey polka-dot pattern, tied with a red and white striped string. A spool of this same string is visible in the top right corner.

Thank
you