

# Diabetes - Innovative Devices

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**How to cite this article:**

Alisha Nayak. Diabetes - Innovative Devices. Ind J Diabetes Endocr 2024;6(1):25-27.

**Abstract**

The digital health revolution is transforming the landscape of medicine through innovation in sensor data, software, and wireless communication tools. Unlike early genetic engineering technique that randomly inserts genetic material into a host Genome, it targets the insertion to site specific location.

**Keywords:** Landscape; Computerized; Artificial Intelligence; Genome.

## INTRODUCTION

In a few short decades; type 2 diabetes research and technological breakthroughs have bought about significant advancements in how the condition is treated and managed.

Here are some of the top innovations helping people with type 2 diabetes better manages the condition today.

Diabetes technologies include the hardware, devices, and software that people with diabetes use to help, manage their diabetes.

**A. CGM or Continuous Monitoring Devices:**

These are devices with tiny sensors that is placed below the surface of skin to measures the amount of glucose in the fluid between cells every few minutes.

It transmits data wirelessly to a device or smart phone.

It monitors the level at set times throughout the day, such as every 5 minutes.

CGMs have become increasingly accurate and much more widely available for home use.

**Alerts and Alarms:**

↑↑↑ Glucose is rapidly rising

↑ Glucose is rising

⇒ Glucose is slowly rising

⇒ Glucose is steady

⇒ Glucose is slowly falling

↓ Glucose is falling

↓↓ Glucose is rapidly falling

**Pros:**

Better control of diabetes

Less hypoglycemic episodes

Less long term complication

**Cons:**

Anxiety

Costly

Alarm fatigue

Unrealistic expectation

**B. Insulin Pumps:**

An Insulin Pump is a medical device that delivers insulin to tissues just underneath the sun.

It is a computerized device which is about the size of deck of cards; can be worn around your

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Received on: 27.05.2024

Accepted on: 23.10.2024



waist, put in a pocket secured with an armband or attached to belt or bra.

An insulin pump can also be more convenient if you are out at work; because all you may need to do is to push a button to deliver the insulin instead of giving yourself a shot.

#### Pros:

- Better control of diabetes.
- Less hypoglycemic episodes
- Less long term complication

#### Cons:

- Costly
- Unrealistic expectation
- Device attached to body

#### C. Smart Pen:

These are the future of diabetes technology.

It is reusable self injection pen which records information about how much insulin you inject and when you inject it.

#### Sensor Insertion:

In-office-5-minute procedure

Make insulin 5 to 8 minutes in upper arm

Insert sensor with custom inserter

Close the wound

#### D) Diabetes Smart Phone Apps:

Now a days Diabetes Apps can track your blood sugar level and show trends, monitor your diet, log your exercise.

Coaching apps can also give you access to highly trained diabetes educators and fitness coaches.

#### E) Artificial Intelligence:

Many aspects of our daily lives depend on AI.

Artificial Intelligence is defined as "The capability of a machine to imitate intelligent human behavior.

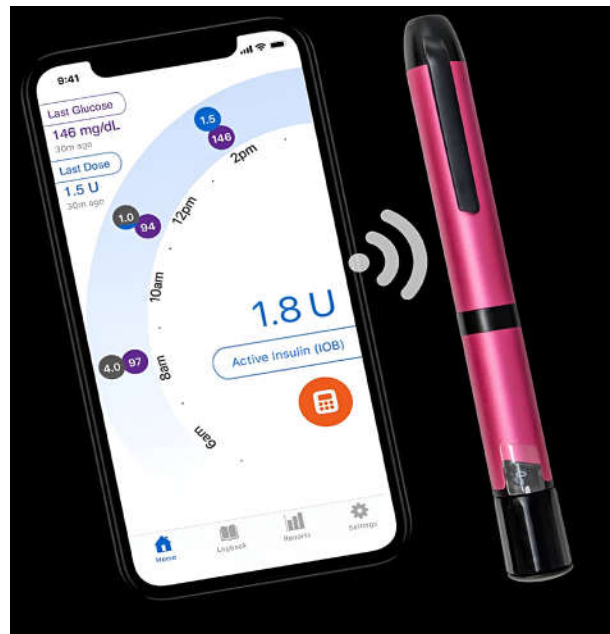
#### Barriers to advancing AI:

1. Discourage developers from including the advance features that may be most useful for physicians and patients alike.
2. Not affordable.
3. Not equally accessible.

## CONCLUSION



CGMs (Source: <https://www.nalamhospital.in/continuous-glucose-monitoring>)



Smart Pens (Source: <https://childrenwithdiabetes.com/medical-devices-and-treatment-t1d/>)



Insulin Pumps (Source: <https://www.medtronicdiabetes.com/treatments/insulin-pump-therapy>)

“Expectations must be tempered by reality”.

We do not yet have technology that completely eliminates the self care. Task necessary for treating diabetes; but these tools make it easier to manage.

#### **Acknowledgement**

The completion of this article would not have been possible without the support and affection of my elders. My parents, who have always supported me in this field, have helped me in doing this job.

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