

# ADULT TRACK

## DIABETES TECHNOLOGIES IN ADULTS



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#EPIConf2022

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# COI

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Senseonics, Dexcom, Medtronic, REMD Pharmaceuticals, Eli Lilly,  
Mannkind, IAFNS, IM Therapeutics



# HISTORY OF INSULIN PUMP TECHNOLOGY



1960s/70s

1970s/80s

1990s

2000s

2009 to present



# MEDTRONIC 670G-770G HYBRID CLOSED LOOP



- Target BG : 120 mg/dl
- Temporary target: 150 mg/dl
- Auto mode driven control
- Calibration required-Guardian 3 CGM
- Contour Next Meter
- 770G: Bluetooth capabilities-AccuCheck Guide meter



# MEDTRONIC 780G HYBRID CLOSED LOOP



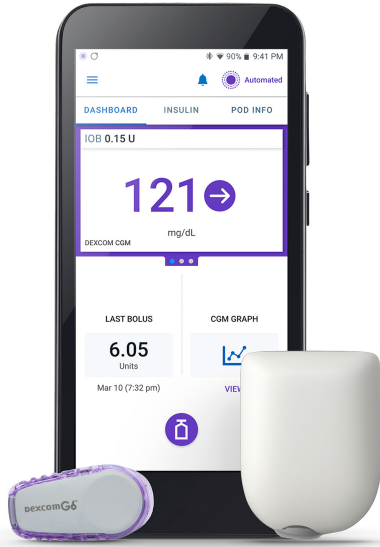
- Not FDA approved
- Target BG: 100,110,120 mg/dl
- Auto mode driven control
- Automatic correction dose
- Less calibration: Guardian 4 CGM
- Bluetooth capabilities

# OMNIPOD DASH

- Bluetooth-enabled Pod
- Mirroring to phone app
- Calorie King app integration
- Connectivity to glucose meter
- Side by side Dexcom CGM monitoring on app (No direct integration)



# OMNIPOD 5 HYBRID CLOSED LOOP



Pod and Dexcom G6® shown without the necessary adhesive.

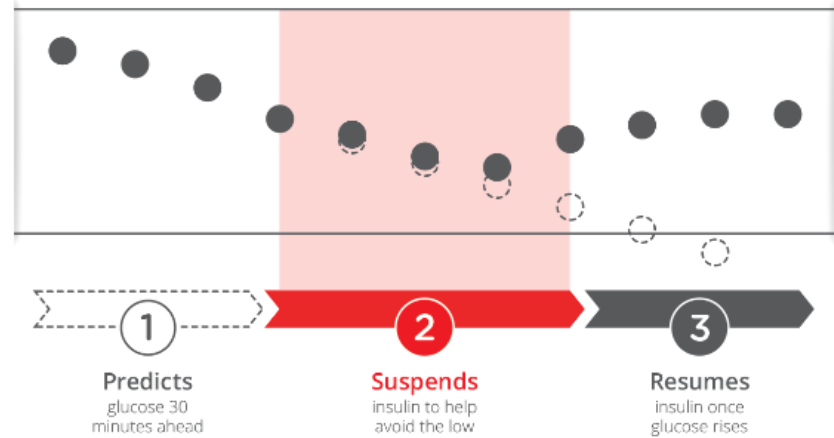
- Bluetooth enabled POD
- Dexcom G6 CGM- no calibration
- Target BG: 110-150 mg/dl
- Only HCL that considers CGM trends for decision
- Smart phone full control ( Android first then Apple devices)
- No auto bolus (adaptive basal only)



# TANDEM X2 BASAL IQ



- Predictive low glucose suspend
- Integration with Dexcom G6
- No calibration





# TANDEM X2 CONTROL IQ HYBRID CLOSED LOOP

- Dexcom G6 - no calibration
- Auto correction boluses
- Sleep and Exercise mode
- Bolus capability with mobile app



# TANDEM MOBI HYBRID CLOSED LOOP

- Not FDA approved
- Patch pump of Tandem
- Wireless charging
- 50% smaller than Tandem
- Smartphone control
- Bolus button

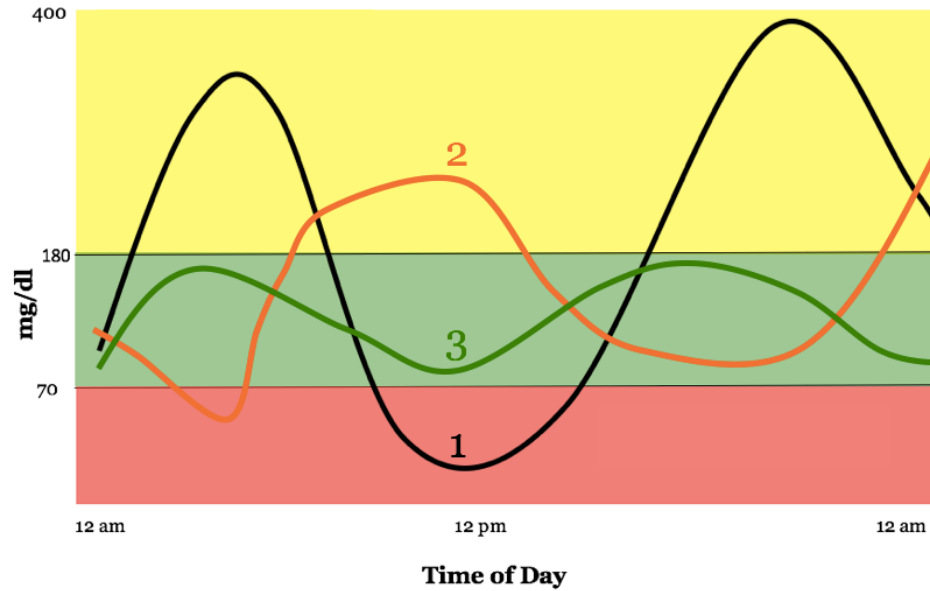


# BETABIONICS ILET HYBRID CLOSED LOOP



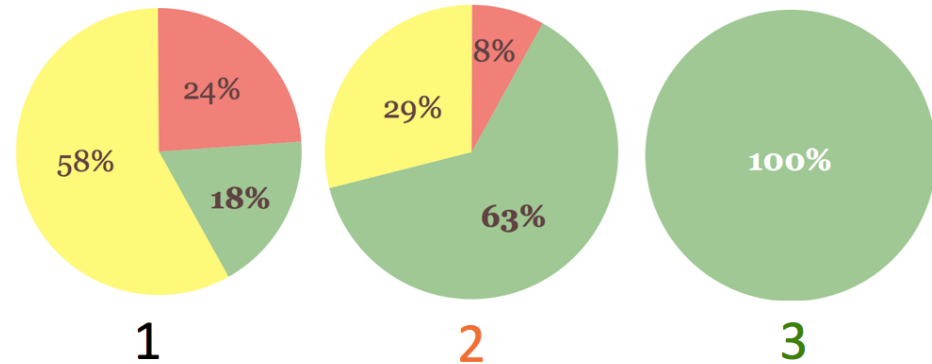
- Not FDA approved
- Dexcom G6 CGM- no calibration
- No carb counting
- Meal announcement required
- Learning algorithm by time
- Next Gen: Insulin and Glucagon ILET HCL

# BEYOND HBA1C- TIME IN RANGE



## The Many Faces of a 7% A1c

Time spent **HIGH** **IN RANGE** **LOW**



# DEXCOM G6

- 10-day use, 2-hour warm up
- No calibration
- Simplified insertion
- High/low alarms
- Urgent low soon alarm (Predicts 55 mg/dl in 20 mins)
- Sharing with loved ones
- Siri integration for voice command
- iCGM- connects hybrid closed loops, smart pen



# DEXCOM G7



- Not FDA approved
- Sensor and transmitter- one piece
- 10-day use, 30 mins warm up
- 60% smaller than Dexcom G6
- 12-hour grace period

# FREESTYLE LIBRE 2



- 14-day use
- Required scanning
- Reader or Smartphone use
- No calibration
- Simplified insertion
- High/low alarms
- ICGM classification



# FREESTYLE LIBRE 3

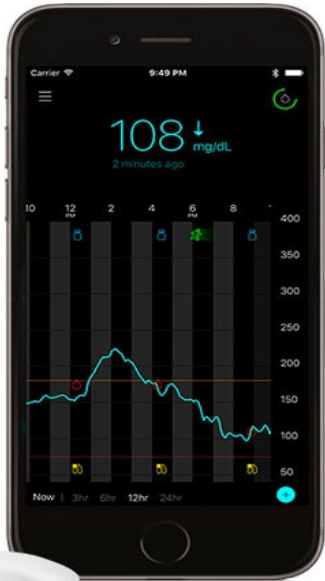


- Not FDA approved
- Penny size CGM
- No scanning required- real-time CGM
- 14-day use



# MEDTRONIC GUARDIAN SENSOR 3

- 7-day use
- 2 calibration per day (3-4 calibration can optimize accuracy)
- High/low alarms
- Sharing with loved ones
- Works with Sugar IQ Diabetes Assistant



# MEDTRONIC GUARDIAN SENSOR 4

- Not FDA approved
- 7-day use
- 1 calibration per day
- Integrated with 780G pump



# MEDTRONIC SYNERGY

**Synergy  
Sensor**



Synergy

**VS**

Guardian® Sensor 3



- Not FDA approved
- 10-day use
- No overtaping
- Expected no calibration



# SENSEONICS EVERSENSE E3



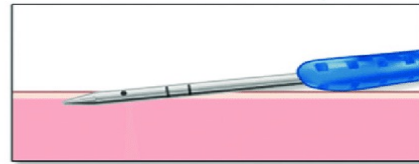
- Implantable CGM- insertion in clinic visit
- 6-month use
- Wearable, rechargeable transmitter
- 1 calibration per day (First 21-days, 2 calibrations)
- High/low alarms on phone
- On-body vibration alerts

## 1 Make incision



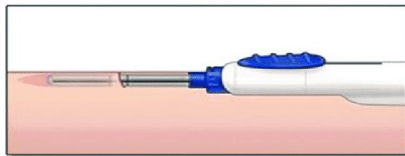
5-8 mm incision upper arm (Lidocaine)

## 2 Create subcutaneous pocket



Approximately 3-5 mm below skin surface

## 3 Insert sensor



Sensor placed with custom inserter

## 4 Close incision



Steri-Strips™ to close



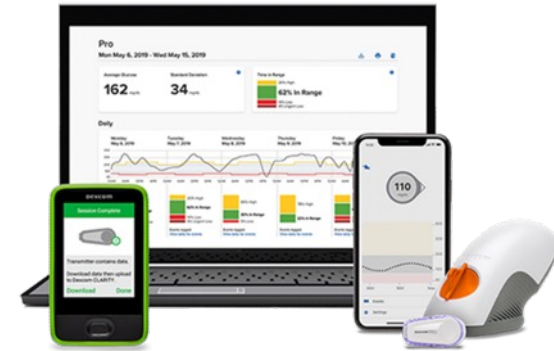
# PROFESSIONAL CGMS

## Medtronic iPro 2 Freestyle Libre Pro Dexcom G6 Pro



- 6 day disposable sensor
- Reusable transmitter
- Blinded results
- 2 calibrations a day
- Patient returns reusable transmitter for download

- 14 day disposable sensor
- Combined sensor-transmitter
- Blinded results
- No calibrations
- Patient returns disposable sensor-transmitter for download



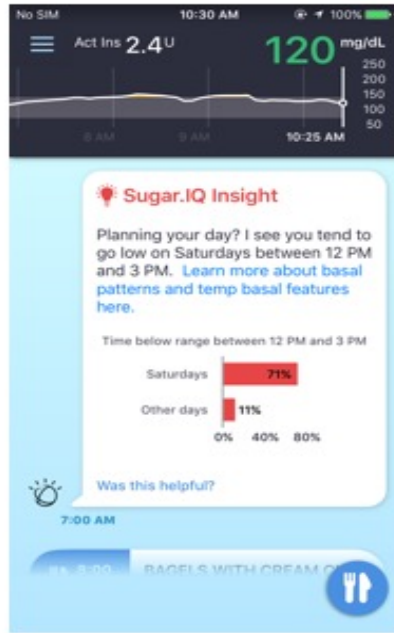
Smart devices sold separately.

- 10 day disposable sensor
- Disposable transmitter
- Blinded or unblinded results
- No calibrations
- Patient returns receiver device for download, or uses smart phone for download via Clarity

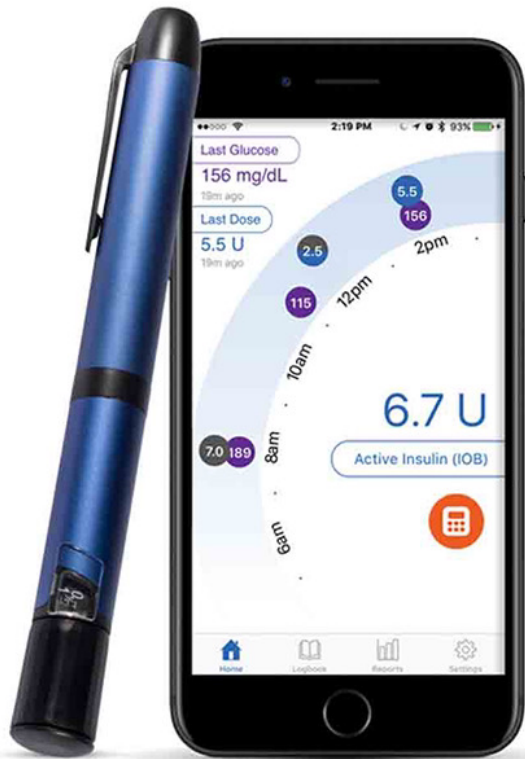


# DECISION MAKING TECHNOLOGIES

## SUGAR IQ DIABETES ASSISTANT APP



# INPEN-SMART PEN



- Pen is paired with app via Bluetooth
- Novolog, Humalog, Fiasp cartridges
- Insulin carb ratio, correction, insulin on board calculator (like using a pump)
- Insulin dose tracking/reminders
- Data sharing with others
- Integration with Dexcom G6 and Medtronic Guardian 3 CGMs
- Decimal point dosing
- Once a year replacement

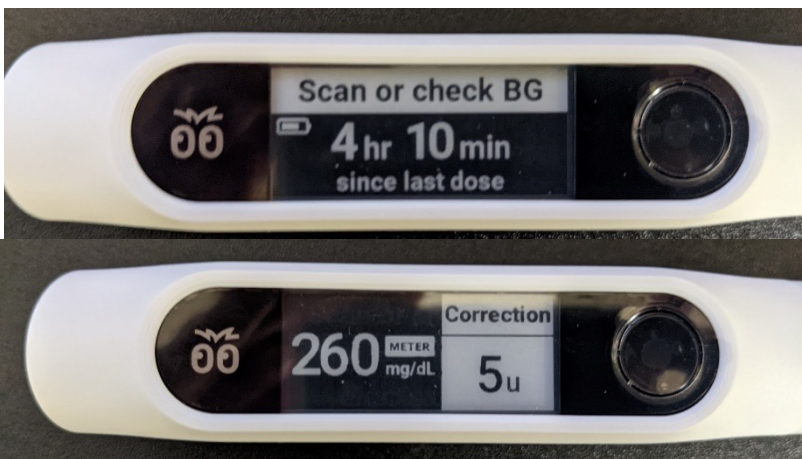




# BIGFOOT UNITY SMART PEN



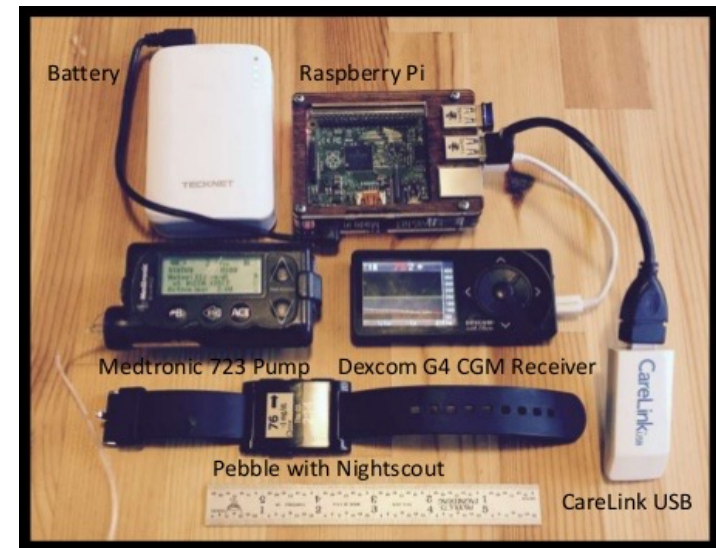
- Basal and bolus pen cap
- Bolus pen cap can be integrated with Freestyle Libre 2
- Clinic based prescription model
- CGM data in smart pen app
- Rechargeable





# DO IT YOUR OWN AP- NOT FDA APPROVED

- NightScout #wearenotwaiting , x-Drip
- LOOP (Uses Medtronic and recently Omnipod)
- Open APS
- Android APS
- HAPP



# SUMMARY

- Diabetes Technology moves fast
- Individualizing the technology for the patient
- Patient-centered approach with shared decision-making
- Close monitoring/ trouble shooting after introduction of a new technology

**ALL OF THE DIABETES TECHNOLOGIES MENTIONED IN THIS PRESENTATION WERE TESTED AT THE BARBARA DAVIS CENTER. THANKS TO ALL OUR PATIENTS CONTRIBUTING TO RESEARCH.**



## WE APPRECIATE OUR PATIENTS AND THEIR FAMILIES



Barbara Davis Center is working for a better life for people with diabetes

