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Camping with the new Omnipod 5 Automated Insulin Delivery System (AID)

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www.diabetescamps.org

Special Appreciation to Insulet Corporation for their Sponsorship of this Training Presentation

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Objectives:

- Understand the basic functionality of the new Omnipod 5 AID system
- Be able to describe which settings can be adjusted to improve diabetes management at camp
- Understand practical strategies and tips for helping maintain safe glucose levels during camp with the OP5

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Automated Insulin Delivery (AID) Systems

- Automated Insulin Delivery refers to insulin pump delivery systems that respond to sensor data in determining insulin delivery moment by moment
- There are 3 FDA approved systems on the market along with several non FDA approved open-source systems that you will see at camp this summer
- None of the FDA approved systems are totally independent of the user and all require carbohydrate input
- The three FDA approved pumps are:
  - Medtronic 670 and 770 G
  - Tandem Control IQ
  - Omnipod 5 (the newest system – which is the topic for today)

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Omnipod 5 AID System

Omnipod 5 App: On Controller OR Personal Smartphone

Pod + Algorithm

Continuous Glucose Monitor (CGM)

- **<u>Pod= tubeless "patch" insulin pump</u>**
  - Holds up to 200u insulin, replaced every 3 days
- **<u>AID algorithm integrated into each pod</u>**
  - CGM communicates *<u>directly</u>* to pod
  - Delivers "microboluses" every 5 min, based on projected glucose trends (60 min prediction horizon)
- **<u>Customizable glucose targets</u>** between 110-150 mg/dL
  - Can program different targets throughout day
- **<u>Smartphone app</u>** to operate pump, view data
  - Omnipod 5 app on compatible smart phone OR Controller (PDM) provided by Insulet

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Manual Mode or Automated Mode

Manual Mode = conventional insulin pump

- No insulin automation
- Delivers programmed basal rates

Automated Mode = Automated Insulin Delivery (AID)

- Algorithm calculates basal insulin using CGM data &based on Total Daily Insulin (TDI)
- Does not use programmed basal rates

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Dashboard Screen

- Blue= manual mode
- Purple = automated mode

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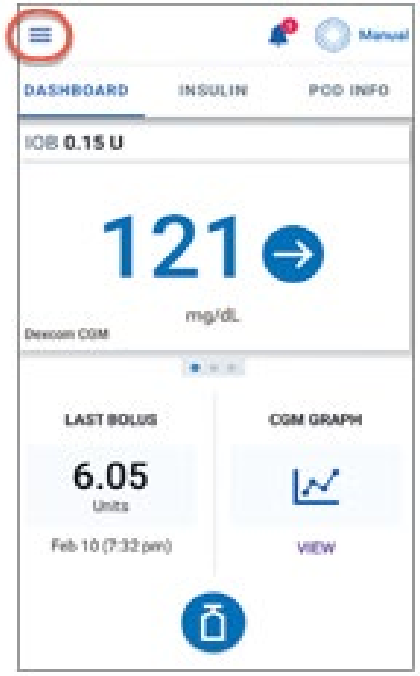
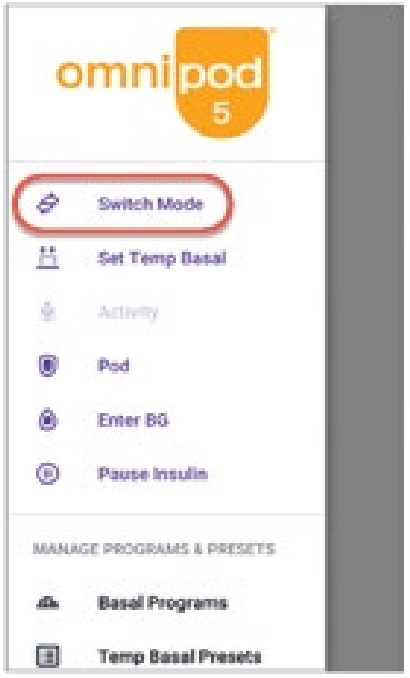
Switching Modes



• Tap the Menu button



• Tap **Switch Mode**

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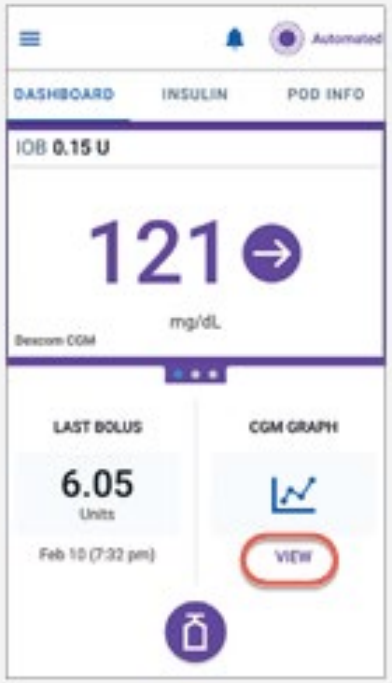
CGM Graph

- Can see the last 3 hours of CGM data
- Visual representation of automated insulin delivery

View CGM Graph



- Tap **VIEW** under CGM Graph

- Tap the ? symbol to see a Legend of symbols used in the CGM graph

Note: CGM Graph differs slightly in appearance depending on Mode

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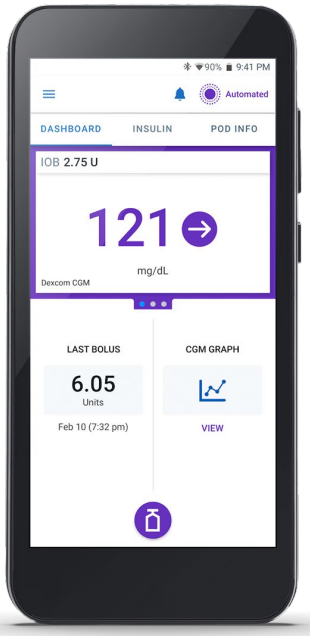
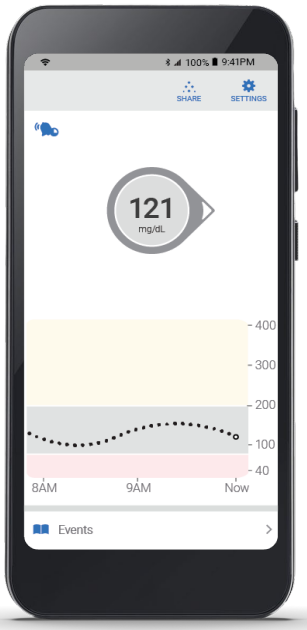
System Communication

Omnipod® 5 App

- Activates Pod
- Displays alerts/alarms
- Receives insulin delivery and CGM information





Dexcom G6® app

- Starts sensor
- Displays alerts/alarms

Omnipod® 5 Pod

- Delivers bolus insulin commands from Omnipod® 5 App
- SmartAdjust™ technology uses CGM values to automatically adjust insulin

Dexcom G6® CGM

- Sends sensor values to Pod and Dexcom G6® app

Pod receives CGM values

- The Omnipod® 5 App does not have to be near the Pod for basal insulin delivery in either Manual or Automated Mode.
- It is recommended to keep the Omnipod® 5 App nearby as it displays important information such as alerts and alarms.

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System Communication: Take Home Points

✓Must use the ***Dexcom G6 app on personal smartphone*** to manage the CGM (start sensor sessions, troubleshoot sensor problems, calibrate sensor if needed)

- Dexcom G6 app *cannot* be downloaded onto the Omnipod 5 controller

✓CGM transmitter must be entered into Omnipod 5 App for automated mode to work

✓Pod receives glucose data directly from the Dexcom CGM transmitter

- Controller/smartphone with omnipod 5 app *does not* need to be in range of pod for automation to occur

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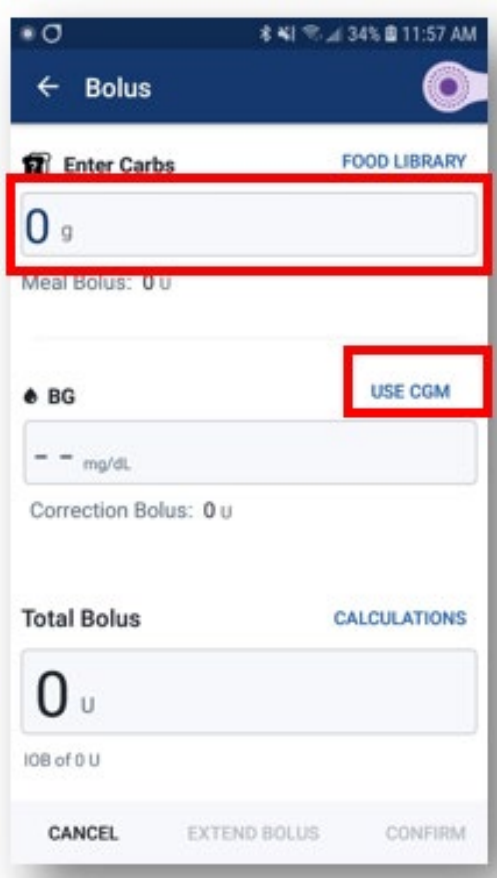
Smart Bolus Calculator

- Bolus calculator may adjust bolus dose based on CGM trend arrow
  - In Automated and Manual Modes
  - May increase calculated dose if trend is up, may decrease if trend is down
- Tap “use CGM” to incorporate CGM value *and* trend into bolus calculation
- Manually enter CGM/BG value into BG box if desire NOT to incorporate CGM trend into bolus calculation



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C.A.R.E.S.- Summary of Clinically Relevant AID Information

PANTHER PROGRAM
CLOSING THE LOOP ON DIABETES TECHNOLOGY EDUCATION

C.A.R.E.S. FRAMEWORK FOR ADVANCED DIABETES DEVICES

C CALCULATE	• How does the algorithm calculate insulin delivery? • Which components of insulin delivery are automated (e.g. basal suspensions, basal modulation, high glucose corrections, food boluses, etc.)?
A ADJUST	• How can the user adjust insulin delivery? • Which parameters can be adjusted to influence insulin delivery during automation (e.g. carbohydrate ratios, insulin action time, basal rates, sensitivity factors)? • Which parameters are fixed?
R REVERT	• When should the user choose to revert to open-loop / no automation? • When will the system default to open loop/no automation?
E EDUCATE	• What are the key education points for the advanced diabetes device (e.g. essential training, tips and tricks, best practices, etc.)? • How does the user optimize time using the automated features? • Where can users and clinicians find additional education?
S SENSOR / SHARE	• What are relevant sensor characteristics for each device (e.g. calibration and therapeutic blood glucose requirements, duration of sensor wear, etc.)? • What are the system capabilities for remote monitoring and cloud-based data sharing?

https://www.bdcpantherdiabetes.org/device-comparison

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Calculate: Omnipod 5

- Automates Basal Insulin delivery ("adaptive basal") based on projected glucose trends (60 min into future) aiming for user-programmed target glucose value
- Automated insulin delivery based on Total Daily Insulin (TDI)
- TDI is updated with every pod change (~ every 72hr), permitting adaptation to changing insulin needs

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Adjust: Omnipod 5

- **CANNOT** adjust basal rates
- **CAN** adjust *I:C Ratios* (for meal boluses), *correction factors* (for user-initiated correction boluses), *Target Glucose* (110-150 mg/dL), *active insulin time (for user-given boluses)*
- **Activity Feature** to reduce insulin delivery (uses target glucose 150 and restricts algorithm insulin delivery)
- Most useful parameters to change: **I:C Ratios, Target Glucose**

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Revert: Omnipod 5

- **"Automated:Limited":** static basal rate determined by algorithm.
  - Activates if no CGM communication with pod for ≥ 20 min.
  - Reverts back to full automation when CGM communication resumes

- May revert to manual mode (programmed basal rates) if at min/max delivery for *several* hours
  - User prompted to confirm CGM accuracy and then can switch back to Automated Mode after ~ 5 min.

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Educate: Omnipod 5

- Pre-Bolus for all meals & snacks
- Wear pod and CGM in “line of sight” to optimize pod-CGM communication
- Do not override the bolus calculator for correction boluses
  - May be IOB from AID; increases risk of hypoglycemia
- Treat mild hypoglycemia with 5-10g grams of carbs; insulin delivery will have been suspended if hypoglycemia occurs

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Sensor/Share: Omnipod 5

- Dexcom G6 CGM; factory calibrated; 10-day max. sensor wear
- User must use G6 mobile app to start/stop sensor sessions (cannot be done through Omnipod 5 app/controller) & receive CGM alerts
- Can use Dexcom share/follow for remote sharing of CGM data
- Omipod Display/View app for pump data remote sharing
  - *Not available currently but expected to become available

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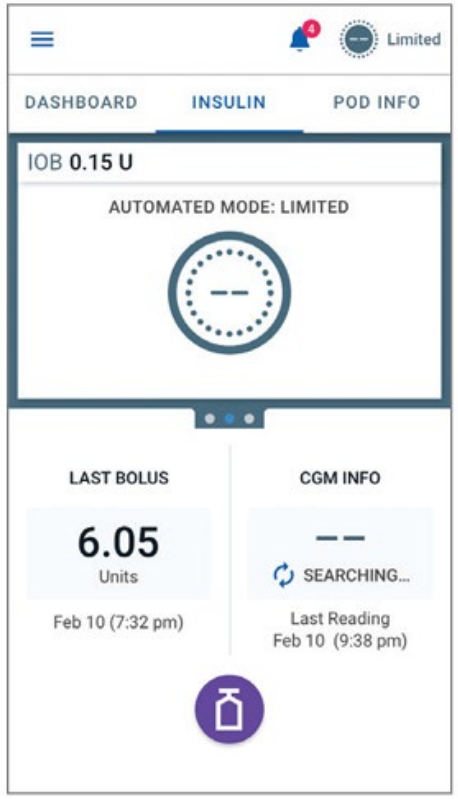
Practical Tip: Troubleshooting

Missing CGM values- Automated Mode: Limited

- This means the Pod is not receiving CGM data
  - Expected during sensor warm up after a new sensor is started
- If not in sensor warm-up, could be either
  - Dexcom CGM problem itself
  - Communication problem between CGM and pod



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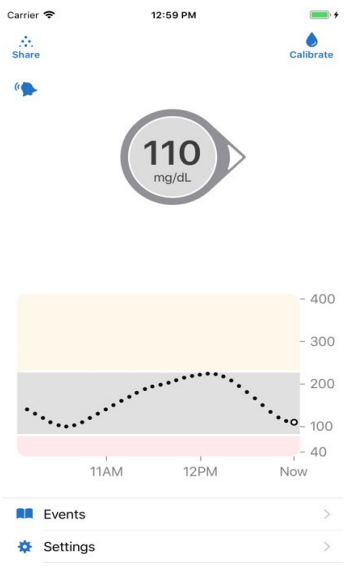
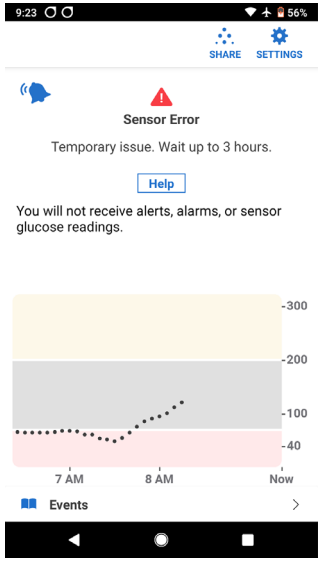
Troubleshooting: Automated Limited

Troubleshoot the source of CGM problem: Check Dexcom App to see if glucose is displaying on Dexcom App.

- If Dexcom app is displaying a CGM glucose value, then the issue is a communication error between the Pod and the Dexcom
- If Dexcom app is not displaying a CGM glucose value, then the issue is the Dexcom sensor itself (i.e. sensor error, sensor expiration)





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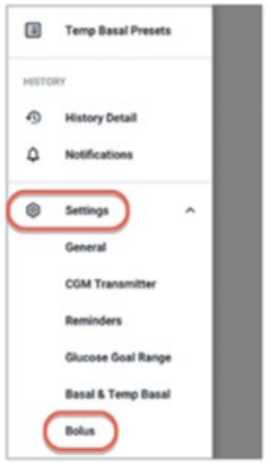
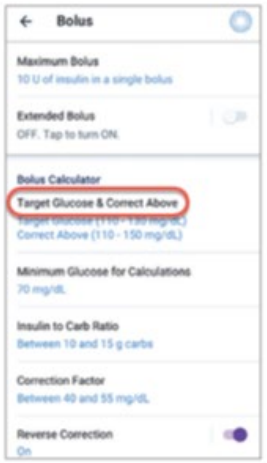
Target Glucose Setting

- Only way to directly influence automated insulin delivery (AID)
- Used for bolus target for user-given correction boluses as well
- Can program 110-150 mg/dL in 10 mg/dL increments
- Can program different targets for different times of day

• Tap the Menu button

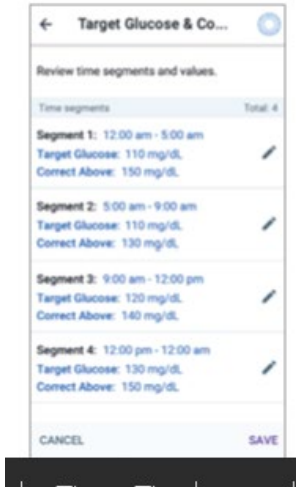


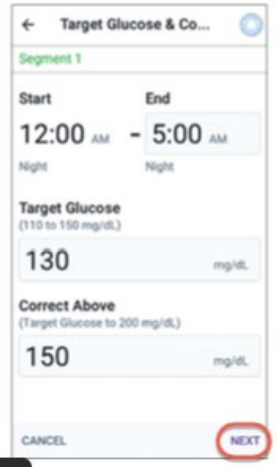
• Tap **Settings**
• Tap **Bolus**



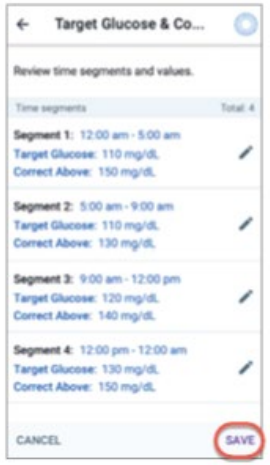
• Tap **Target Glucose & Correct Above**

• Tap **NEXT**





Edit time and/or



• Tap **SAVE**

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Questions?

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Omnipod 5 is headed to camp

Key points to know

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On camp arrival

- Consider setting activity target for the first few days at camp
- Or adjust the pump to a target range higher than is programmed (for example if the target is 110, consider changing to 130 mg/dl while at camp)
- Optional target values are 110 to 150 in 10 mg/dl increments
- Review insulin to carbohydrate ratios with the family on arrival
- Consider changing them to a less aggressive number as activity is generally higher at camp, and less insulin is needed to cover food

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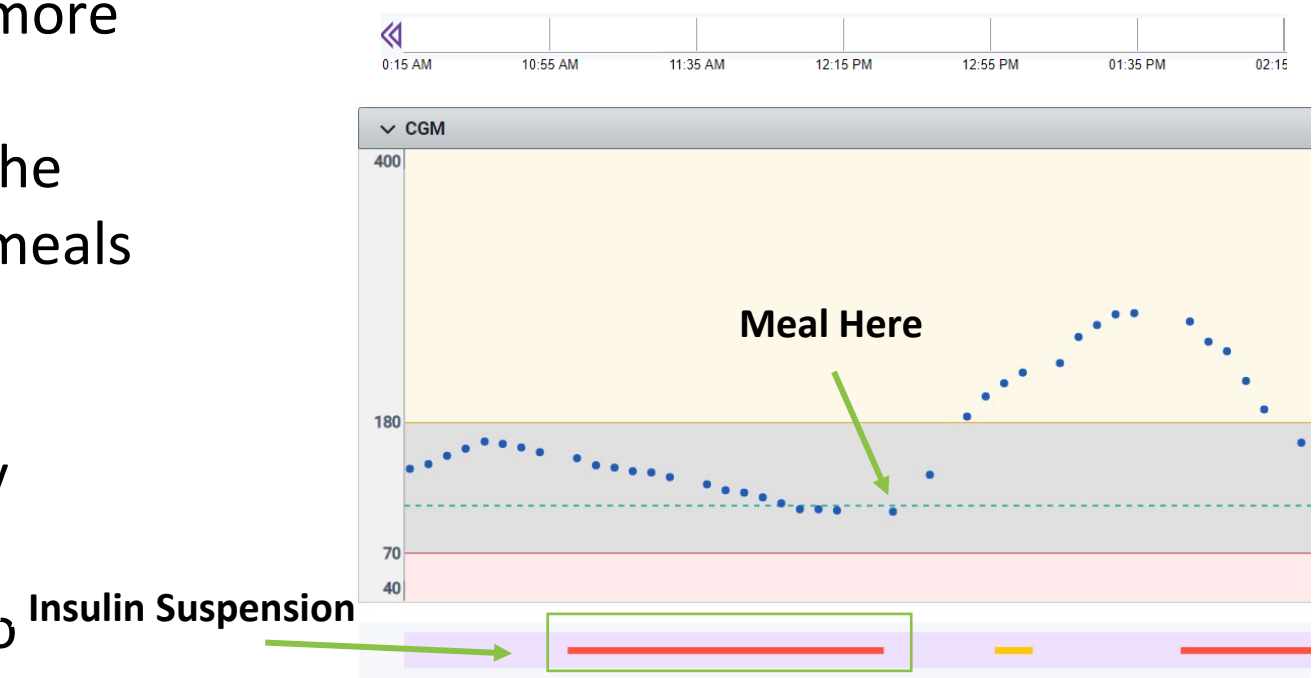
Troubleshooting: Hyperglycemia

Hyperglycemia after meals

- Strengthen I:C ratios to get more bolus insulin for meals
- This should only be done if the trend is consistent (several meals at that time sequentially)
- Make sure to consult with a provider prior to making any pump alterations
- Pre-bolus 15-20 min. prior to eating is helpful, but rarely an option at camp



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Hyperglycemia

- If glucose is >250 mg/dl x 2 corrections and not correcting, check for ketones, give an injection of insulin and change the POD
- Consider turning off automation for 2-3 hours to prevent insulin stacking (may not be required – consider hypoglycemia history)

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Troubleshooting: Hypoglycemia

- Low glucose values are common at camp due to increased activity
- Consider changing the target or using the exercise mode
- If pattern is generally two hours post a meal, consider making the insulin to carb ratio less aggressive
- If hypoglycemia is after a glucose correction, consider giving a less aggressive correction
- If hypoglycemia overnight, not related to bolus doses
  - Raise Target Glucose overnight
  - If delayed hypo related to exercise, turn on activity feature overnight
- If hypoglycemia is related to exercise
  - Consider trying Activity feature (**activate 1-1.5** hours prior to exercise)

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Managing hypoglycemia

- Omnipod 5 pauses insulin delivery when predicts glucose will drop below the glucose target
- If hypoglycemia occurs, it is very likely that insulin delivery will have been already been paused for a while
- **Treat mild hypoglycemia with less carbs: 5-10g**
  - to prevent rebound hyperglycemia, and subsequent hypoglycemia from increased AID

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Exercise & Activity Feature

Activity feature:

Sets Target Glucose to 150 mg/dL **AND** additionally reduces automated insulin delivery

- May be useful feature for reducing hypoglycemia when reduced insulin needs/greater hypoglycemia risk is anticipated
  - Aerobic exercise
  - Reduced appetite/GI illness
  - Child away from parents, field trip, camp etc.

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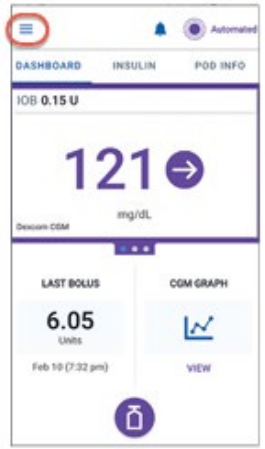
Activity feature

- Only available in automated mode
- Can be programmed up to 24 hours
- Can cancel easily after being programmed



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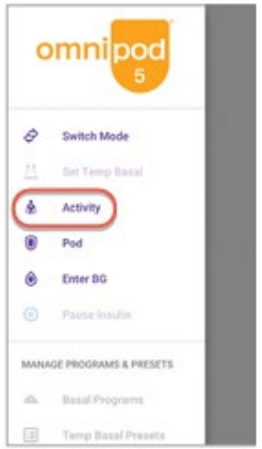
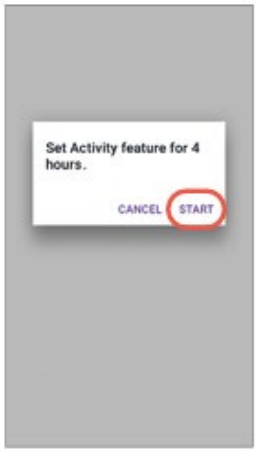
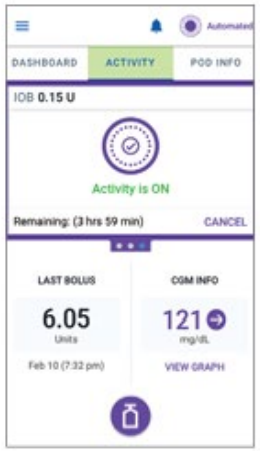


• Tap **Activity**

• Tap **Duration** field
• Set Duration (1-24 hrs)
• Tap **CONFIRM**



• Tap **START**



• The Home screen will show that the Activity feature

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Exercise & Activity Feature

- Activity feature may help prevent hypoglycemia with exercise
  - Trial & Error and individualized strategies needed
  - Enable 1-1.5 hrs before start of exercise for best results
  - Most useful for aerobic exercise, may not be needed for anaerobic or exercise that have a mix (soccer, volleyball, gaga ball)

- Be careful of high carb snacks prior to exercise- may result in increased insulin delivery & more IOB at start of exercise

- If Activity Feature is too conservative and high glucose results, try changing target glucose value instead

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Case study #1

- Jacob is a 12 year old boy who enjoys reading and his parents state he is pretty sedentary with the exception of walking to and from school when it is in session
- He arrives at camp with his new Omnipod 5
- What would you consider to be a good practice in discussing options for settings in Jacob's pump on arrival?

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Case Study #2

- Janine is a 16 year old camper who is overweight. She enjoys sports, particularly mountain biking
- Her most recent A1C was 10%
- At camp she is struggling with lots of high blood glucose numbers, despite being on an Omnipod 5 AID system
- You note very high glucose post meals, with gradual decline as the pump adjusts to the high values.

Case study #3

- Eleanor is an 8 year old camper who is high spirited and generally doing well with her diabetes management according to her parents.
- Her last A1C was 6.4%
- She is generally active and eats a lot of food
- During camp she is homesick and states she does not like the food so is eating little
- She is having lots of low glucose readings over the first 2 days at camp and adjustments do not seem to be making a difference

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Camp and AID systems

- AID systems generally keep children safer than traditional systems
- The statistics demonstrate less hypo and hyperglycemia when using AID systems
- The biggest challenges at camp include:
  - Hypoglycemia due to an increase in activity
  - Infusion site failures which require a change in site
  - Misuse of the pump

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Take home messages

- Automated insulin delivery system generally keep campers safer regardless of the system
- In the OP5 system when in automode you can make adjustments in
  - Carb ratios
  - Correction doses
  - Targets
  - Change to activity mode
  - Active insulin time (only impacts bolus insulin)
- While in automode changing basal rate does not impact the basal delivery
- The system automates basal insulin delivery based on the total daily dose
- Generally, settings can remain – except change the target by either using exercise mode (target of 150 mg/dl and reduction in basal rate) OR set target to higher (140-150) during camp

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Resources

- https://www.omnipod.com/sites/default/files/Omnipod-5_User-guide.pdf
- https://www.omnipod.com/current-podders/resources/omnipod-5
- https://engage.active.com/landing_page/summercamp_2017
- https://diabetesjournals.org/clinical/article/40/2/168/138902/Clinical-Implementation-of-the-Omnipod-5-Automated

Happy camping!

- Questions?

Evaluation – please click on the survey link to answer 4 questions

https://www.surveymonkey.com/r/Q3DFPDR

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