

Telemedicína a eHealth v diabetologii

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Anna Holubová

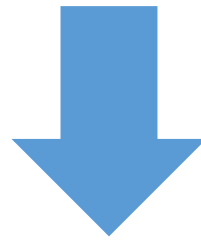
holubann@gmail.com

Centrum podpory aplikačních výstupů a spin-off firem 1. LF UK

Moderní technologie v diabetologii

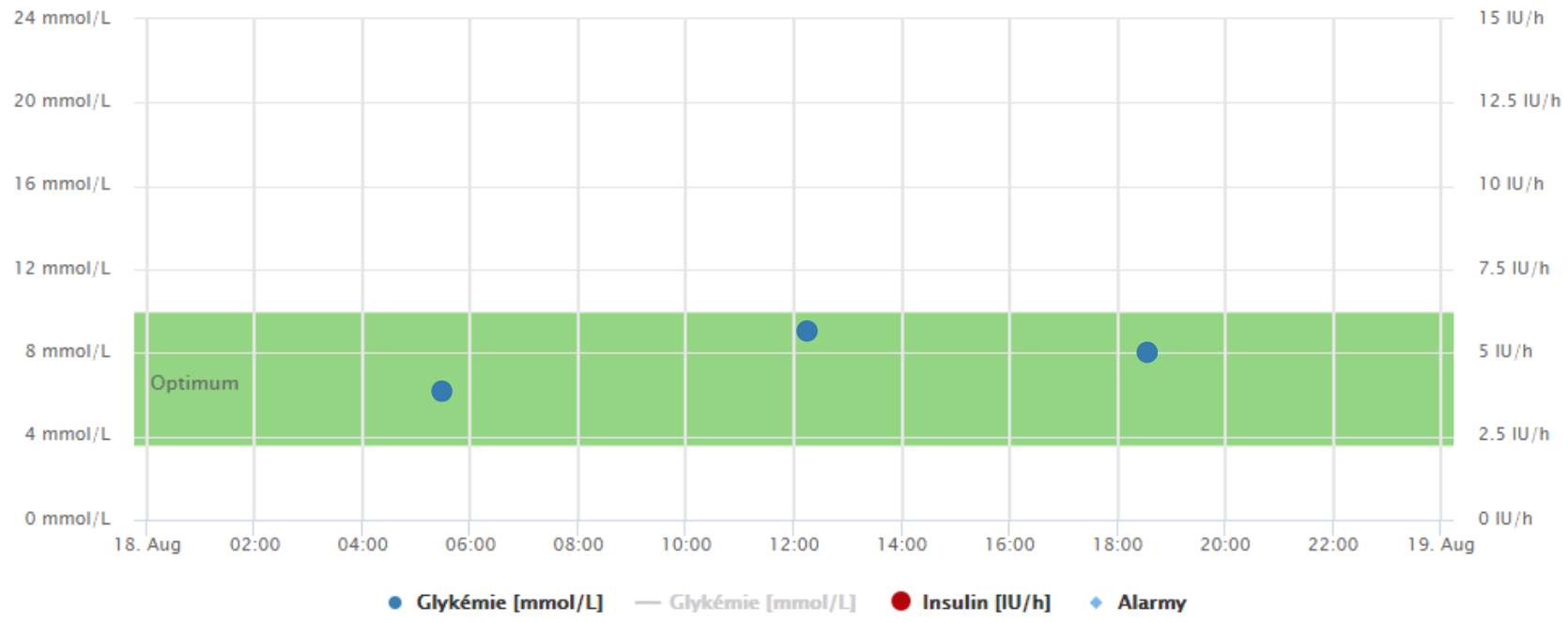
Zimní semestr 2017/18

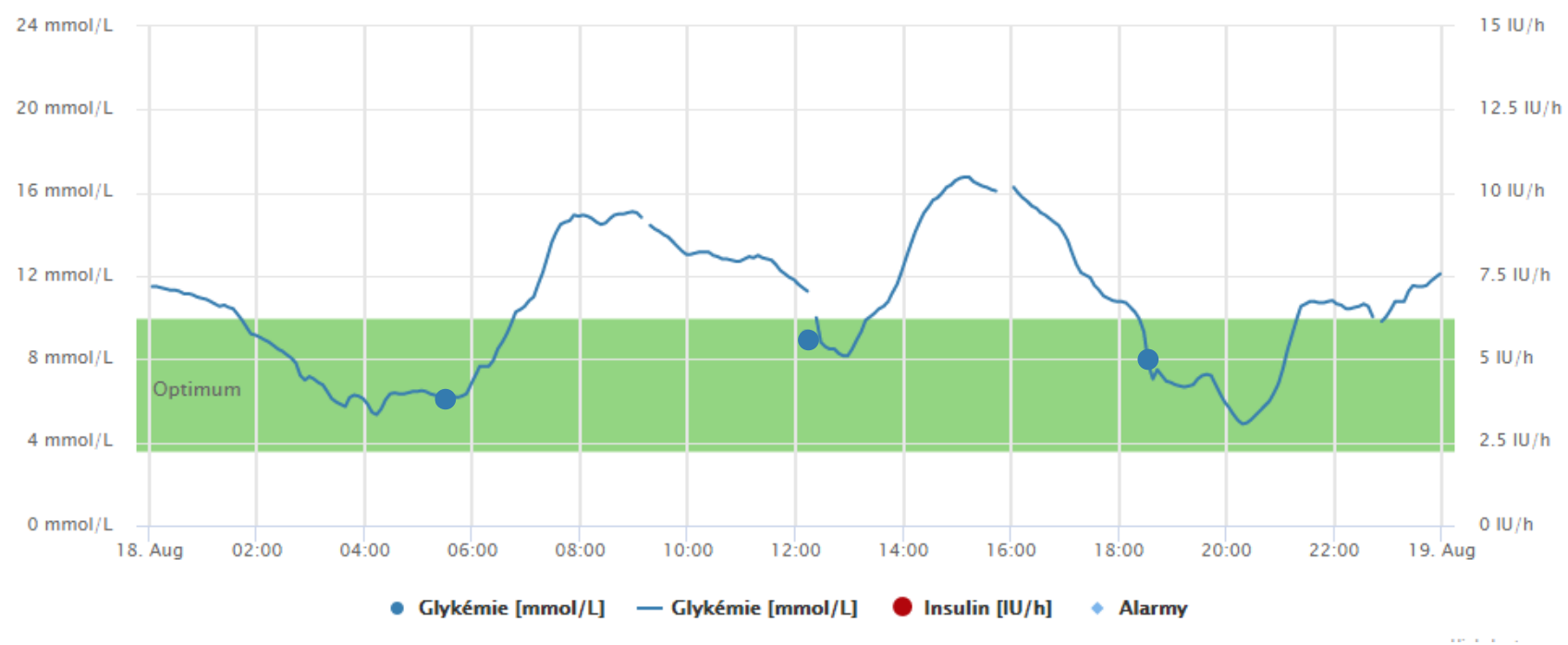
MÁME TECHNOLOGIE, KTERÉ PRODUKUJÍ MNOHO DAT

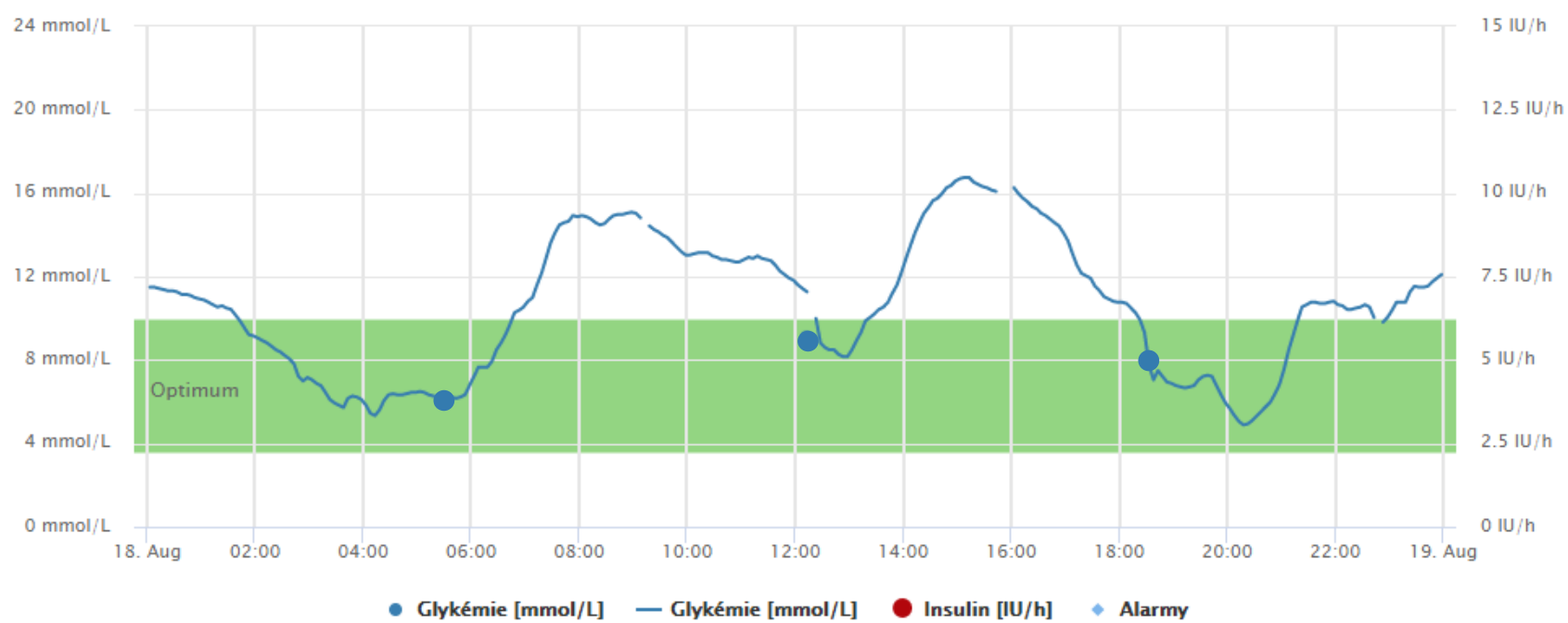


Co s těmito daty?

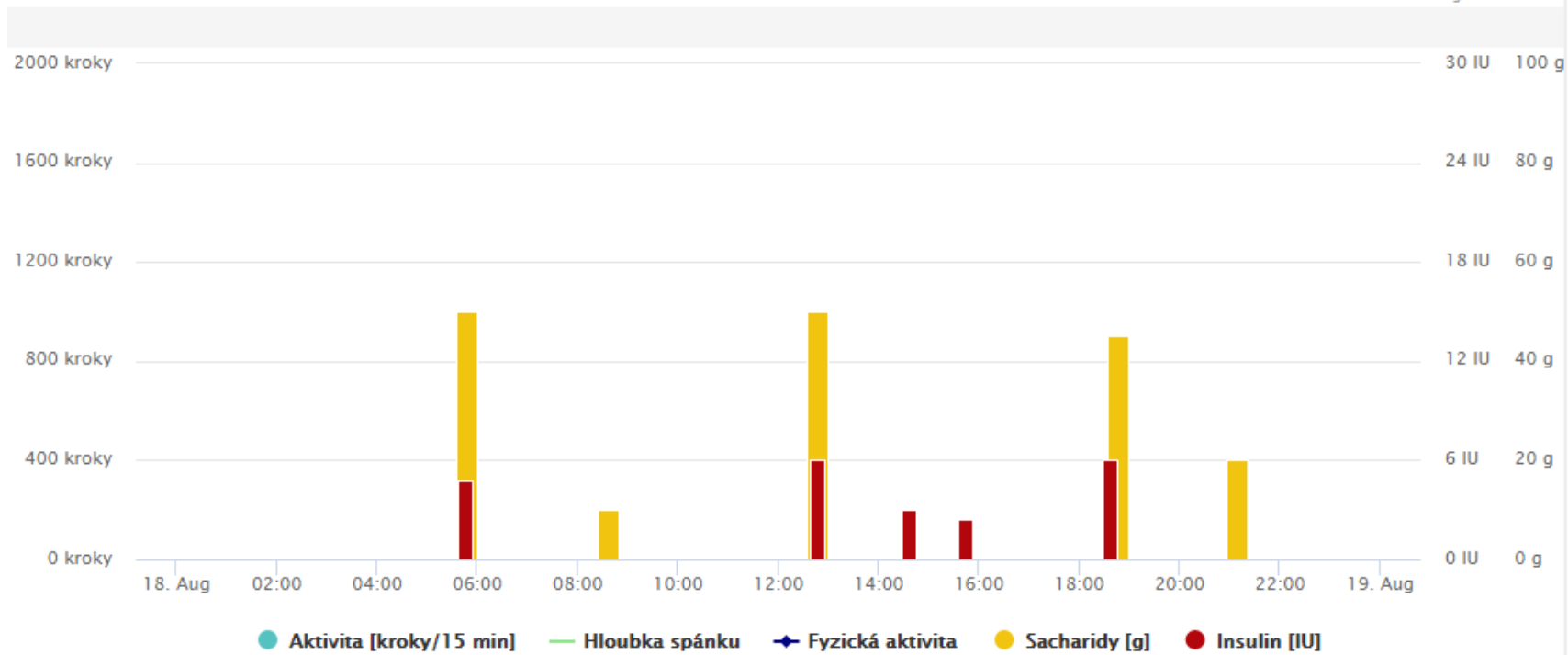
1. Prostá vizualizace měřených parametrů





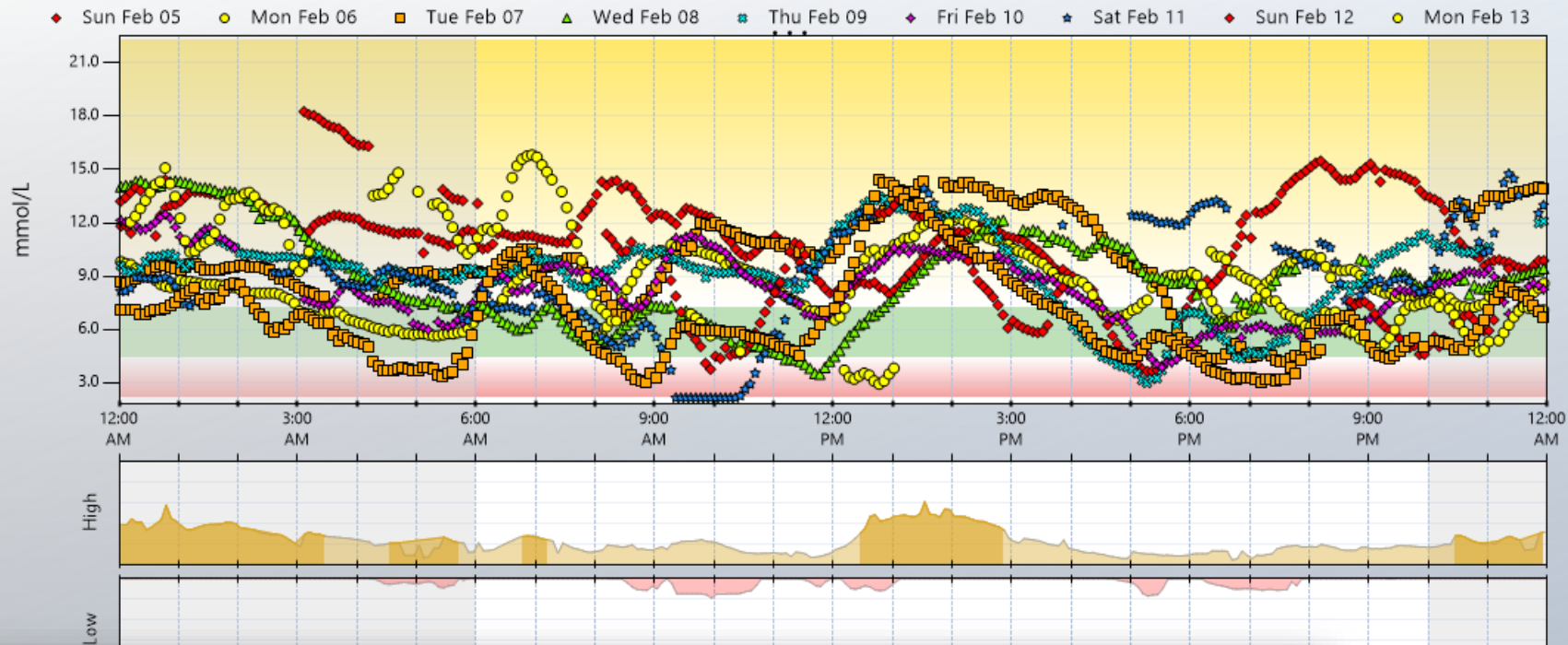


Highcharts.com



2) Statistické vyhodnocení daného parametru
(simple/advanced)

Patterns : Holubová, Anna [SM54401040]

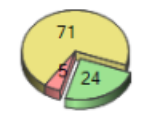


Pattern Insights Summary

Nighttime Lows (0 Found)	No significant patterns detected
Daytime Lows (0 Found)	No significant patterns detected
Nighttime Highs (2 Found)	Most significant pattern of highs found between 10:25 PM and 3:30 AM
Daytime Highs (2 Found)	Most significant pattern of highs found between 12:25 PM and 2:55 PM

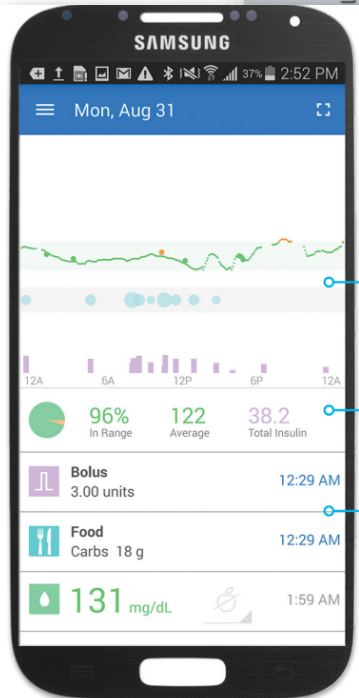
Statistics

Glucose Average	8.92 mmol/L
Sensor Usage	10 of 10 Days
Calibrations / day	1.6
Standard Deviation	± 2.86 mmol/L

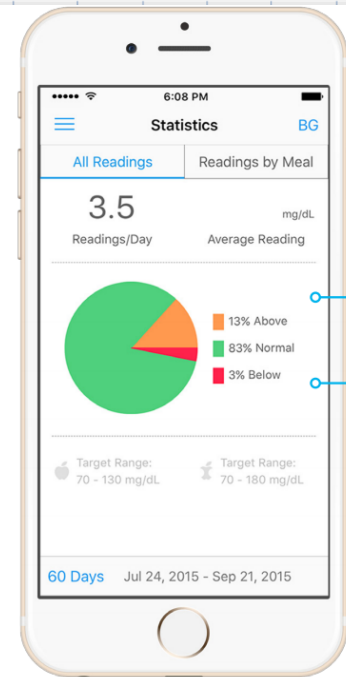


71 % High
24 % Target
5 % Low

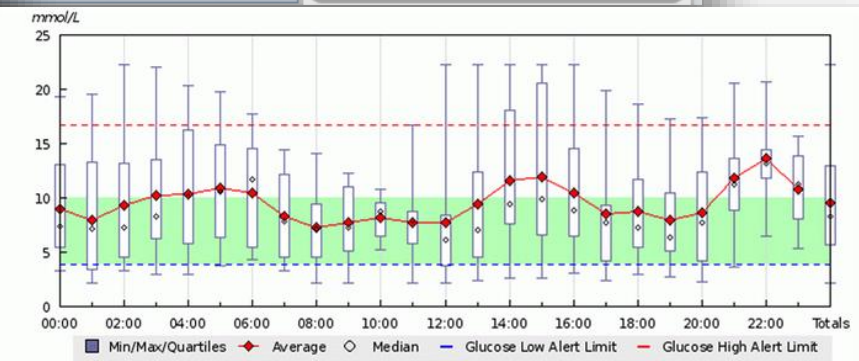
Target Range	4.4 - 7.2 mmol/L
Nighttime Range	10:00 PM - 6:00 AM



- ! From the Side Menu, click **DAY VIEW**.
- Review a graph of your glucose data, carb intake and insulin dosage.
- See your glucose and insulin summary statistics.
- Review your glucose and activity history for that day.



- ! From the Side Menu, click **STATISTICS**.
- Green indicates glucose readings that are in range, while red and orange indicates low and high readings, respectively.
- See how often your glucose readings fall within your targeted glucose range as a percentage of all readings.

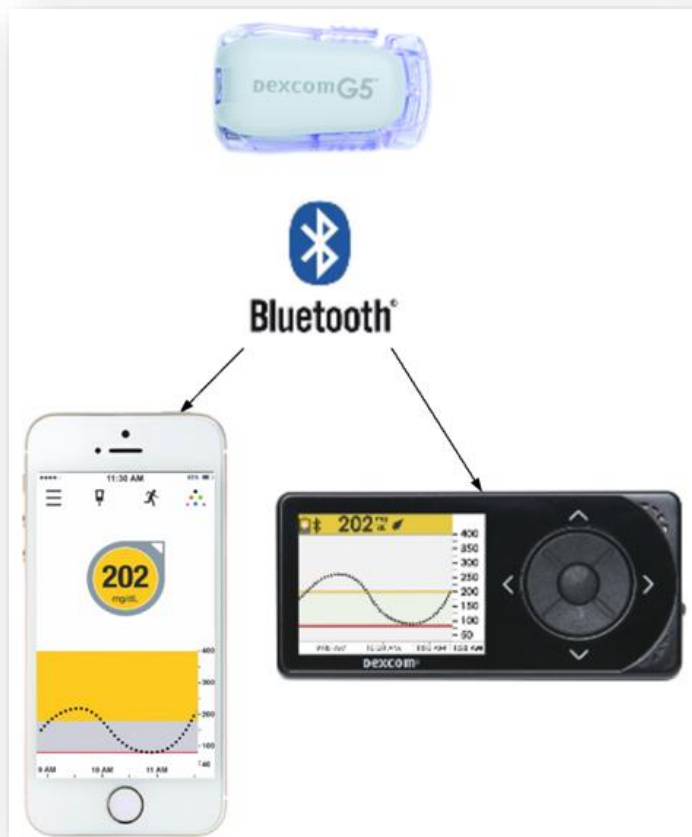


[Show active basal profile](#)

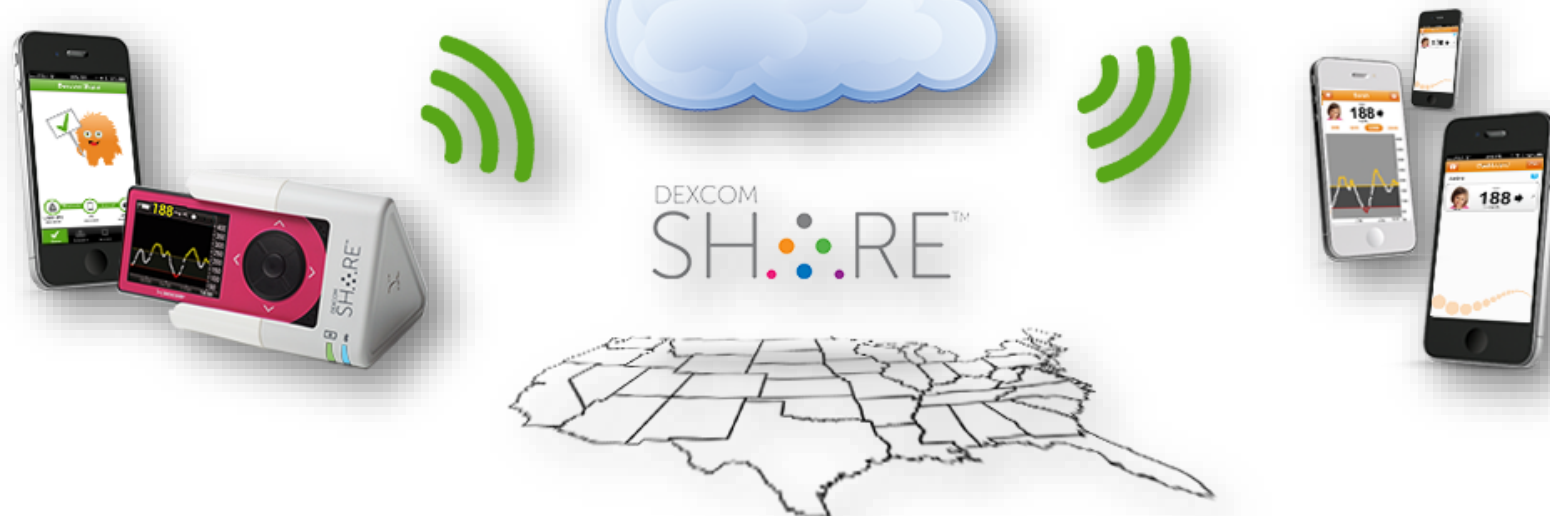
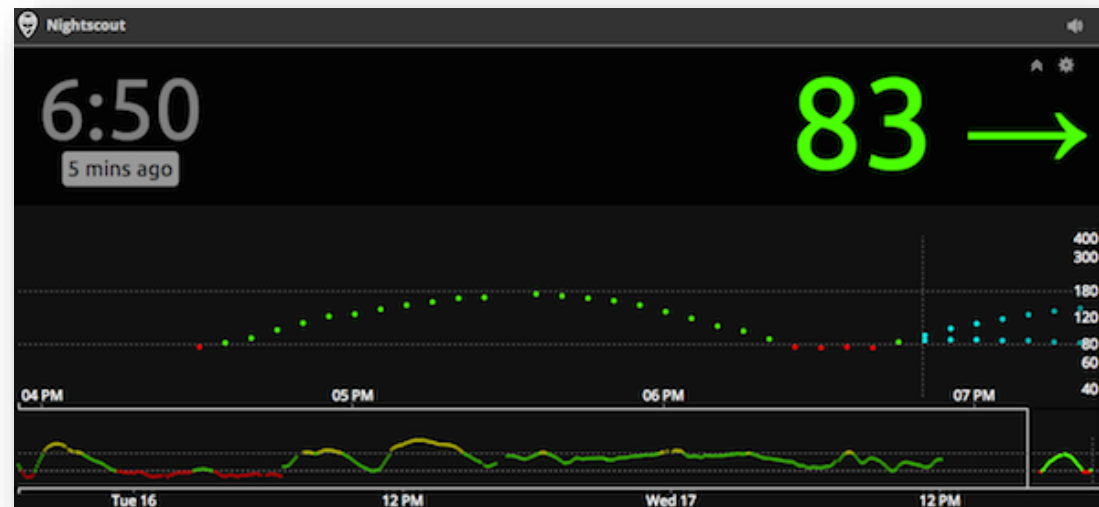
Number of values: 2017	Values above goal (10 mmol/L): 780	Highest value (mmol/L): 22.3	(13/01/2015)
Values per day: 144.1	Values within goal (4-10 mmol/L): 1002	Lowest value (mmol/L): 2.2	(13/01/2015)
Period average (mmol/L): 9.5	Values below goal (4 mmol/L): 235	Standard deviation: 5.1	

Comments ([Show](#)/[hide](#))

3) Sdílení dat

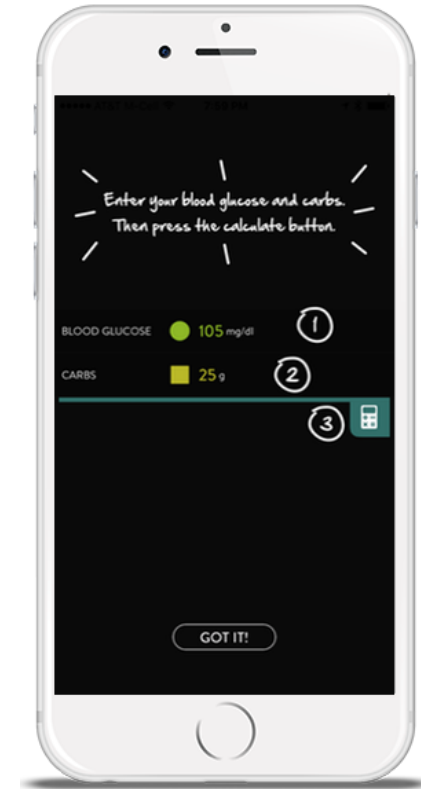
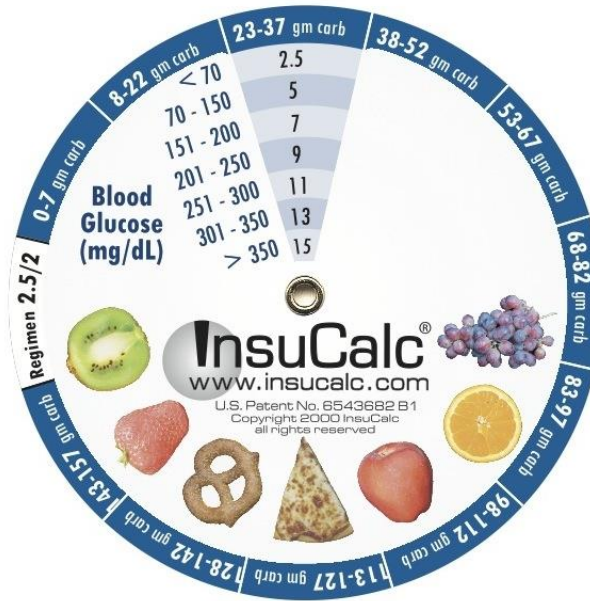


NIGHTSCOUT
#WeAreNotWaiting



4) Automatické výpočty potřebných parametrů

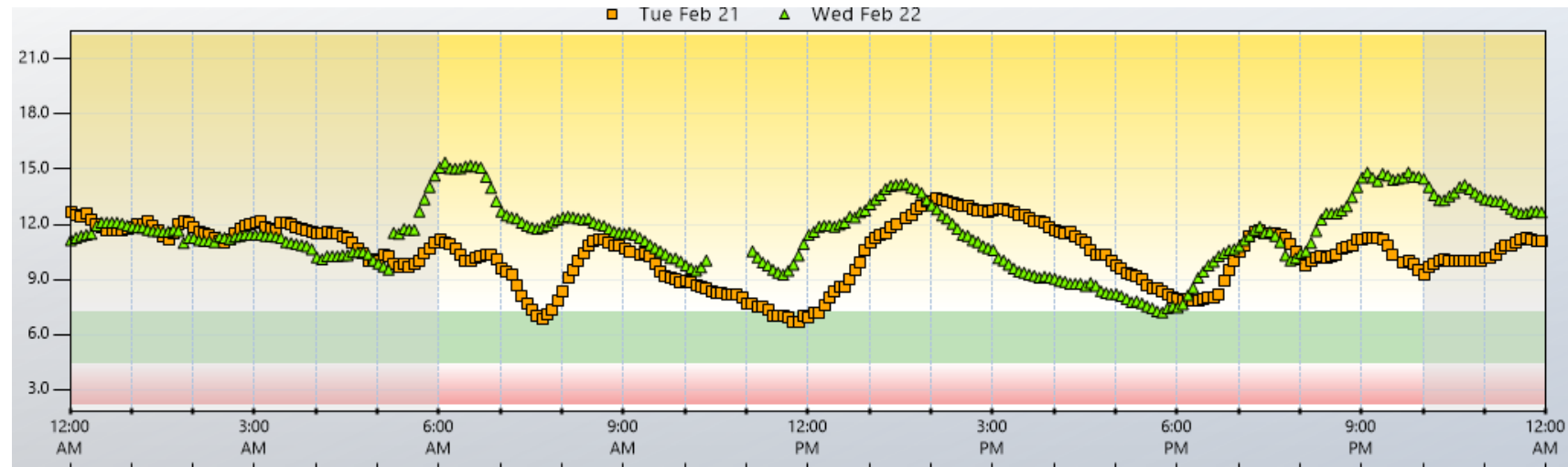
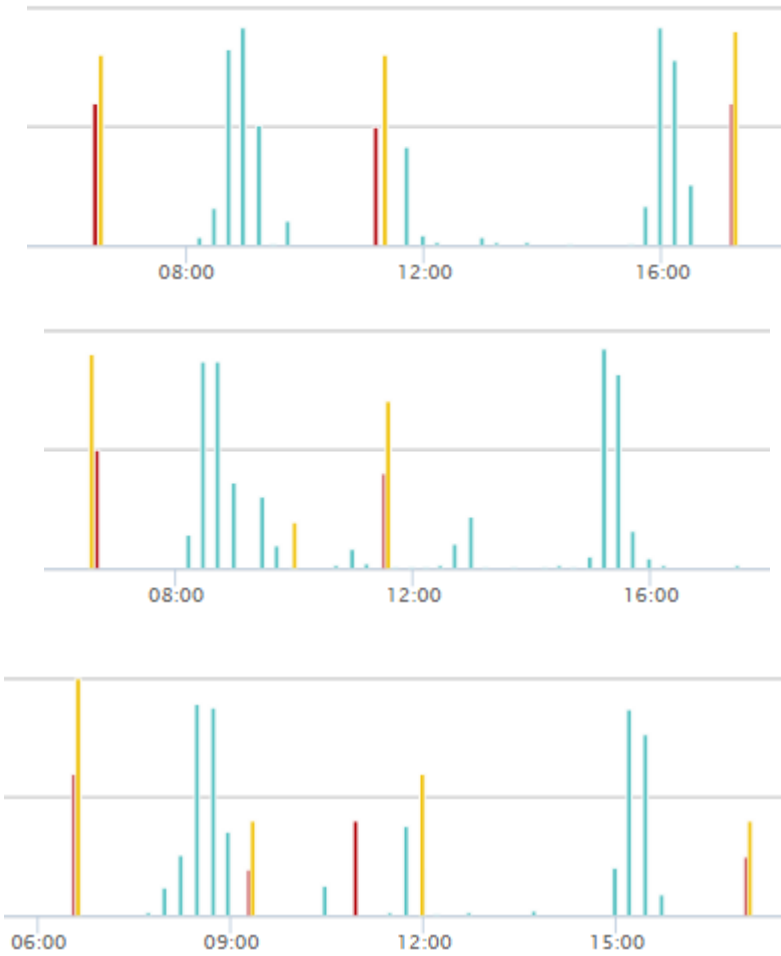
Bolusový kalkulátor, aktivní inzulin,...



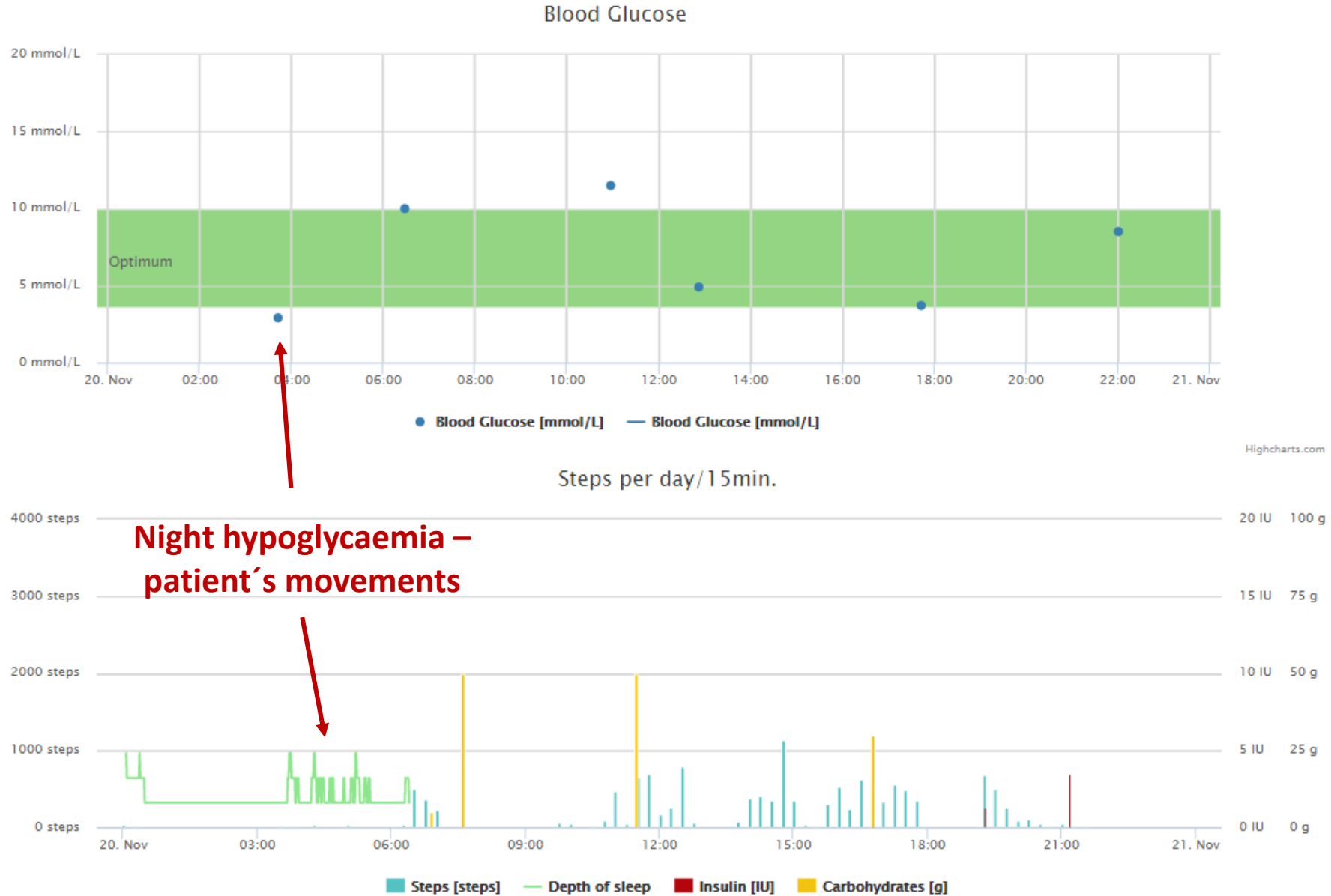
5) Pokročilá analýza dat/data mining

- hledání souvislostí v datech, repetitivních opakování,...
- modelování
- vývoj prediktivních algoritmů
 -
 -
 -

hledání souvislostí v datech, repetitivních opakování

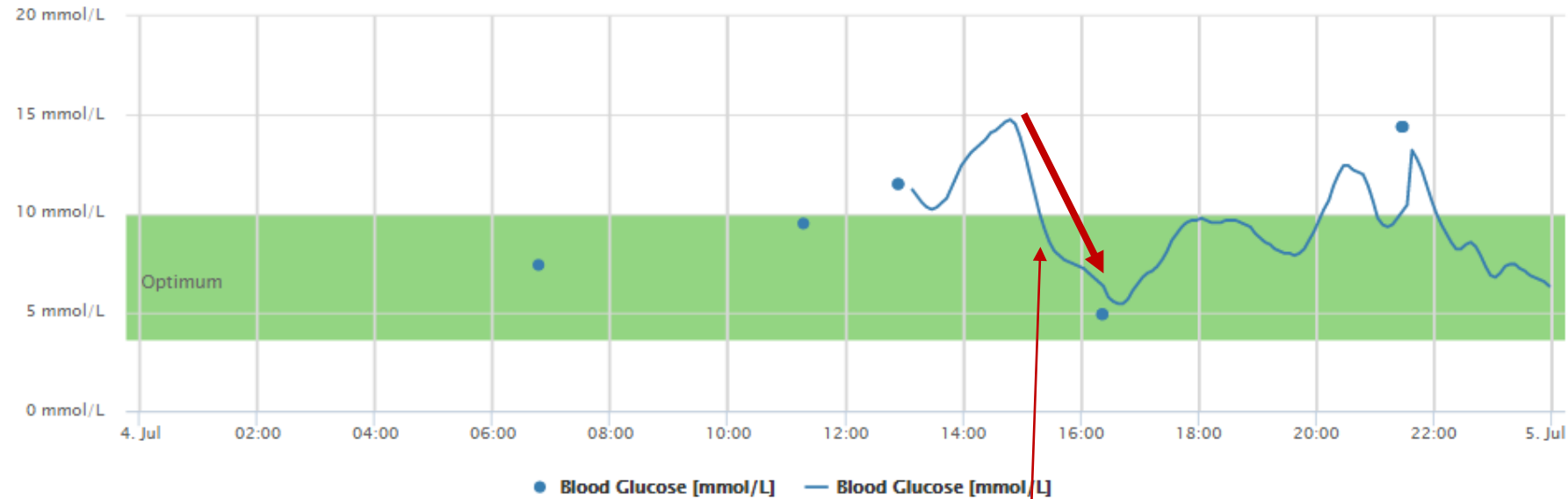


hledání souvislostí v datech, repetitivních opakování



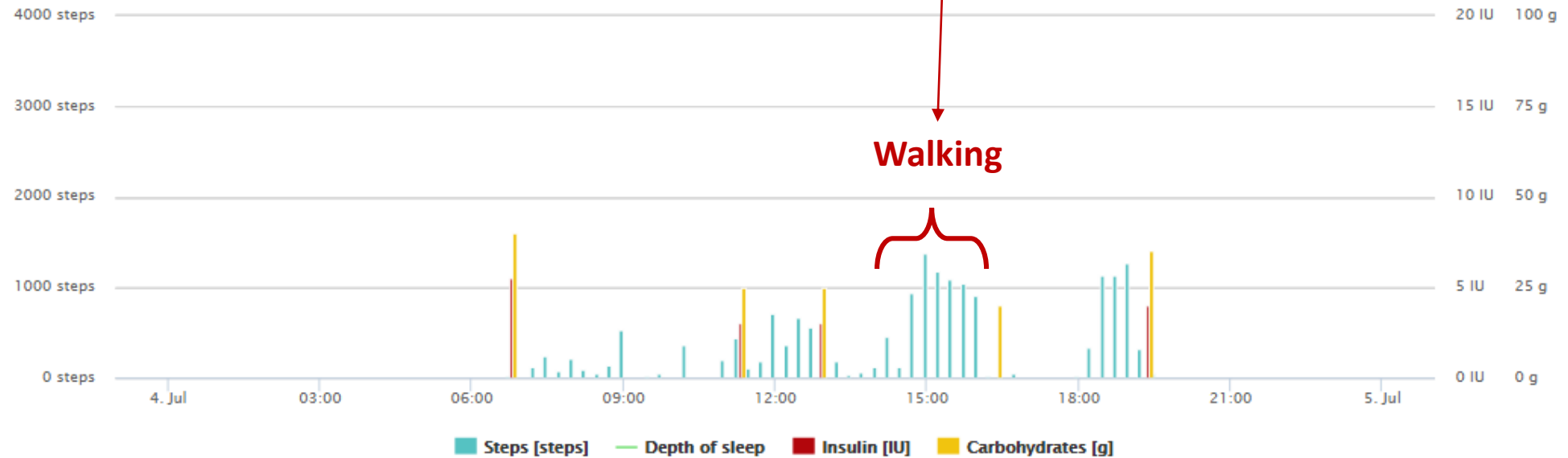
Data from 7/4/2014 (Fr)

Blood Glucose



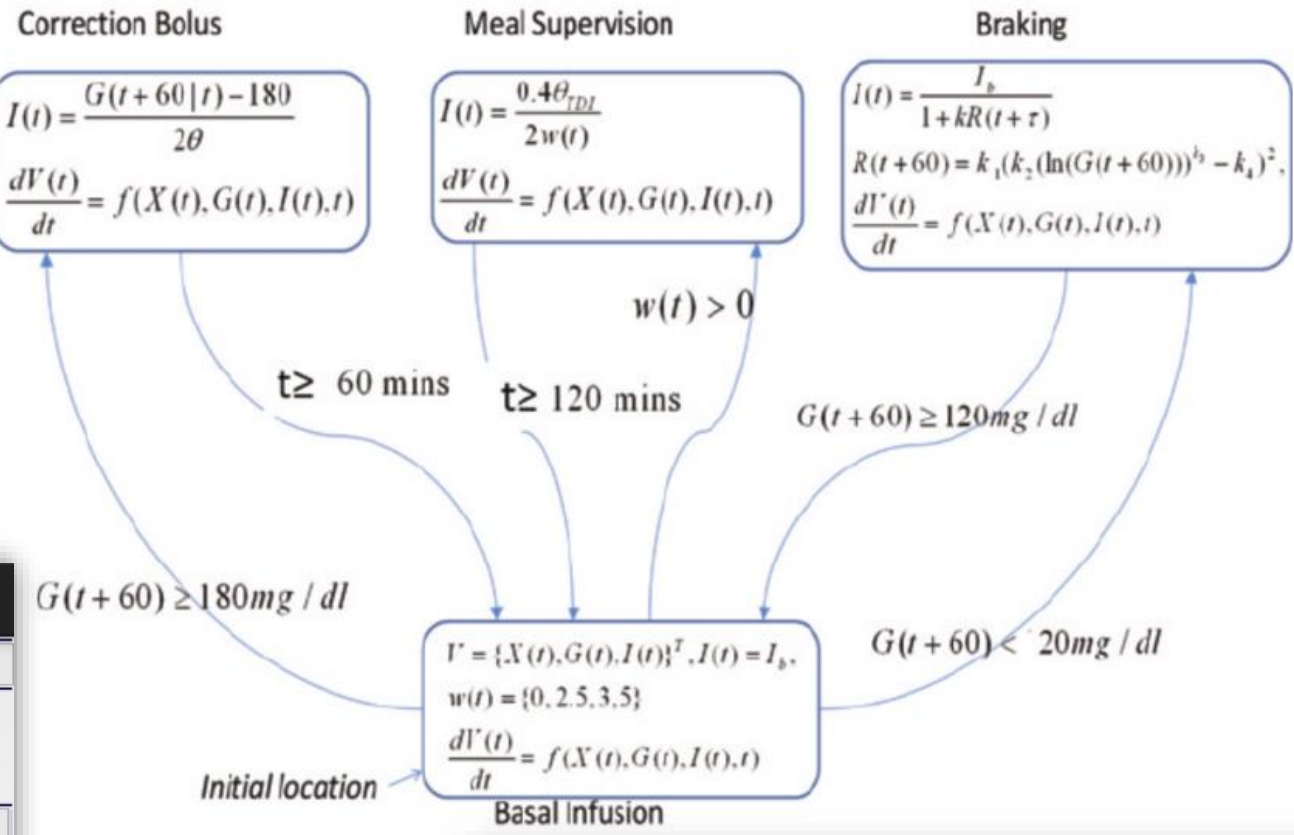
Highcharts.com

Steps per day/15min.



Highcharts.com

modelování



známe souvislosti mezi jednotlivými parametry

Diabetes Automata

Duration: 0:23:58:53.4 30 Min / 1 Sec

Summary for the last 24 hours

BG avg: 7.28 mmol/L BG highs: 1 BG lows: 1
 Insulin: 23.5 IU Carbo: 236.0 g C:I Ratio: 10.0 g/IU

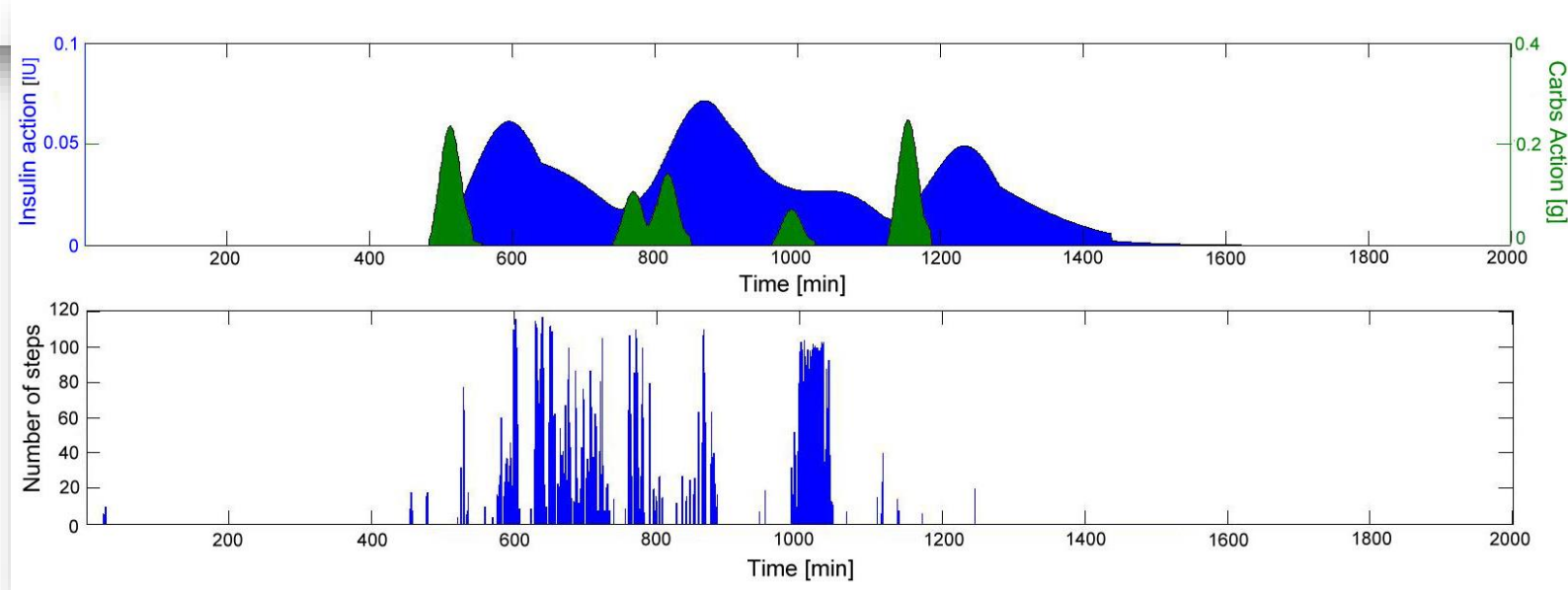
+ Insulin	+ Carbo	+ Activity
Time: 02:12:40.0	Time: 00:00:00.0	Time: 00:00:00.0
Action -10.12014	Action 0.0000	Action 0.0000
All Action -10.43768	All Action 0.0000	All Action 0.0000
%W: 103 %E: 36 #: 2	%W: 0.000 #: 0	%E: 0.000 #: 0
Units: 13.5 IU	Units: 0.0 g	

GSens: 4.55 g/(mmol/L) ISens: 1.11 | 0.69 (mmol/L)/IU

Blood Glucose: 5.03666 mmol/L

Time: 14:05

Buttons: Stop, Pause



Výstupy

- „Decision-making support systems“ (systémy pro podporu rozhodovacích procesů)
- Alarmy
- Notifikace
- Upomínky
- Edukační prostředky

Webové aplikace

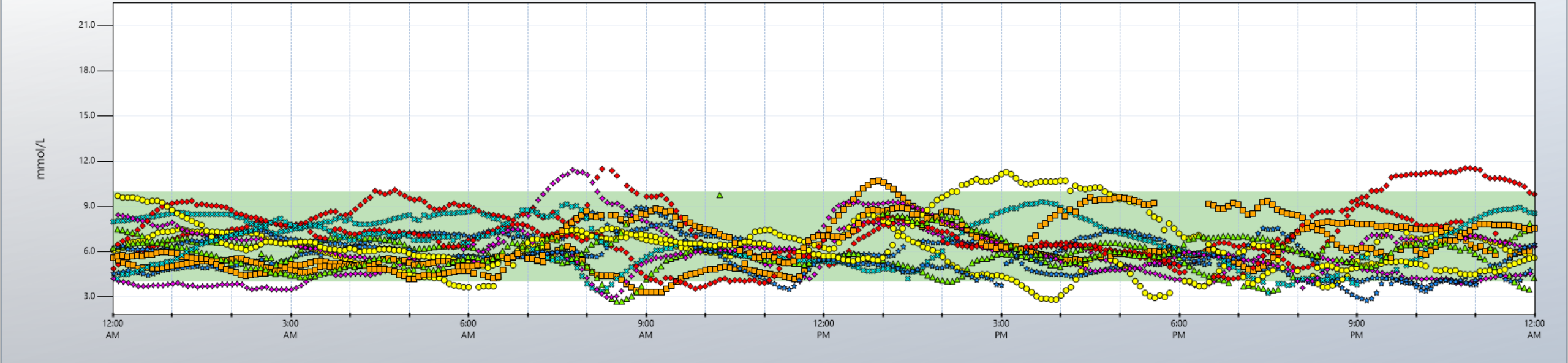
Dexcom Studio/Clarity

Daily Trends from Friday, October 13, 2017 to Thursday, October 26, 2017.
 With all days of the week. ## With all times of the day. ## With all glucose values.

Print Report View Report

14 [Navigation icons]

Daily Trends : , [SM44926205]



◆ Fri Oct 13 ★ Sat Oct 14 ◆ Sun Oct 15 ● Mon Oct 16 ■ Tue Oct 17 ▲ Wed Oct 18 ◆ Thu Oct 19 ◆ Fri Oct 20 ★ Sat Oct 21 ◆ Sun Oct 22 ● Mon Oct 23 ■ Tue Oct 24 ▲ Wed Oct 25 ◆ Thu Oct 26

Statistic	Totals	12am	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm
# of Readings	3617	167	168	168	168	168	168	153	163	150	144	145	128	142	147	155	153	150	142	138	143	136	141	141	139
Average	6.35	6.46	6.57	6.30	6.24	6.33	6.14	6.46	6.98	6.52	6.43	5.85	5.56	6.87	7.25	6.75	6.46	6.53	6.02	5.63	5.78	5.68	6.31	6.41	6.47
Min	2.72	3.72	3.66	3.50	3.50	4.38	3.66	3.66	4.27	2.72	3.33	3.88	3.50	4.72	4.16	3.77	2.83	3.11	2.94	3.72	3.27	3.00	2.77	3.39	3.50
Quartile 25	5.27	5.16	5.44	5.16	5.22	5.22	5.27	5.60	5.88	4.52	5.70	5.49	5.15	5.51	5.77	6.16	5.66	5.44	5.22	4.80	4.83	4.22	4.83	4.33	5.05
Median	6.22	6.33	6.74	6.60	6.22	6.16	5.69	6.38	6.83	6.91	6.49	5.99	5.60	6.77	7.77	6.66	6.22	6.16	5.83	5.60	5.72	5.33	5.94	6.60	6.16
Quartile 75	7.27	7.69	7.33	7.39	7.08	7.16	6.99	7.38	7.80	8.10	7.51	6.38	6.16	8.03	8.32	7.44	6.44	7.33	6.53	6.05	6.52	6.83	7.60	7.38	7.55
Max	11.54	9.71	9.38	8.55	8.66	10.10	9.54	9.05	11.43	11.49	9.77	9.77	7.71	10.71	10.60	11.15	11.27	10.71	9.54	9.21	9.32	9.43	11.15	11.54	11.43
Std. Dev.	1.58	1.56	1.41	1.38	1.21	1.35	1.39	1.27	1.45	2.15	1.53	0.91	0.93	1.52	1.58	1.59	1.80	1.69	1.42	1.20	1.39	1.58	1.96	2.05	1.87
Est. Std. Dev.	1.48	1.87	1.40	1.66	1.38	1.44	1.28	1.32	1.42	2.65	1.34	0.66	0.75	1.87	1.89	0.95	0.58	1.40	0.98	0.93	1.25	1.93	2.06	2.26	1.85
IQR	2.00	2.52	1.89	2.23	1.86	1.94	1.72	1.78	1.91	3.58	1.80	0.89	1.01	2.52	2.55	1.28	0.78	1.89	1.32	1.25	1.69	2.61	2.77	3.05	2.50
SE Mean	0.03	0.12	0.11	0.11	0.09	0.10	0.11	0.10	0.11	0.18	0.13	0.08	0.08	0.13	0.13	0.13	0.15	0.14	0.12	0.10	0.12	0.14	0.16	0.17	0.16
%CV	25	24	21	22	19	21	23	20	21	33	24	15	17	22	22	24	28	26	24	21	24	28	31	32	29

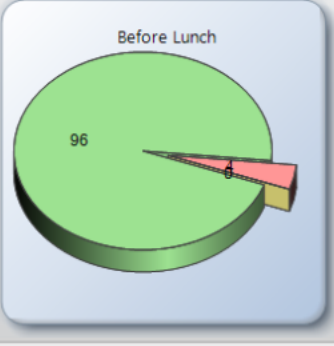
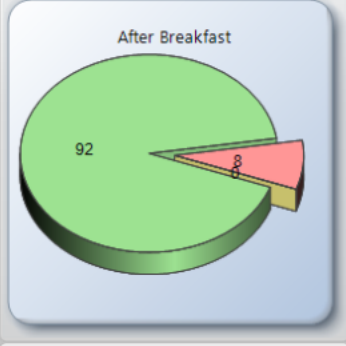
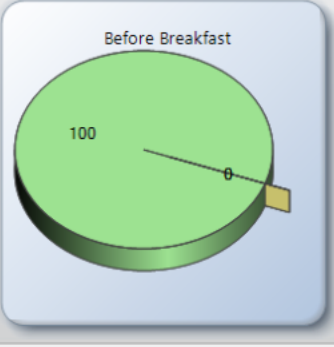
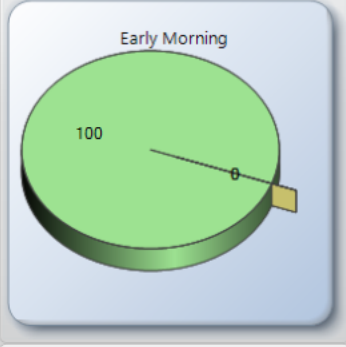
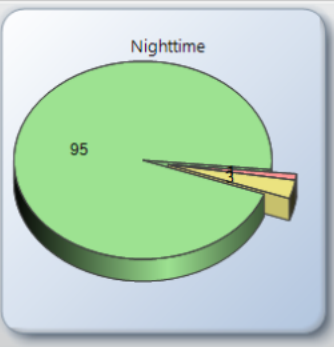
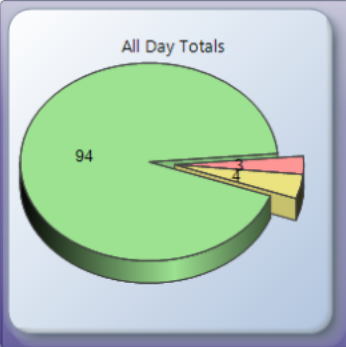
Glucose Percentage Statistics from Friday, October 20, 2017 to Thursday, October 26, 2017. ## With all days of the week. ## With Glucose Target (4.0 - 10.0) ## Total Number of Readings = 1723

Print Report

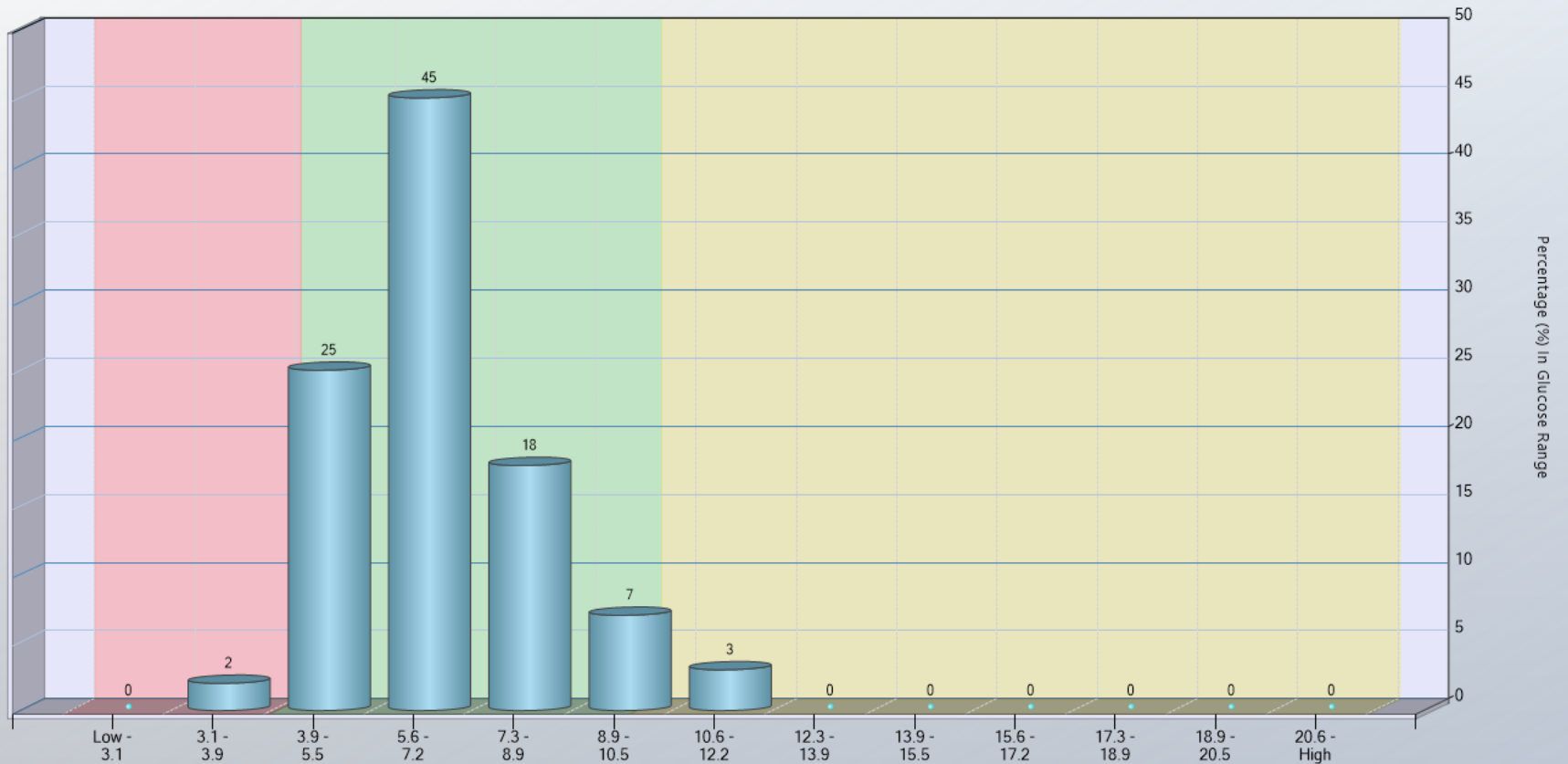
View Report

7

Navigation icons



Glucose Distribution - Readings 1723 All Day Totals



Glucose Ranges (mmol/L)
Low Target High

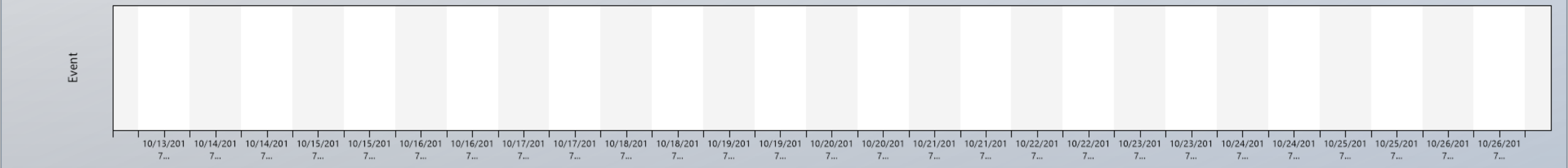
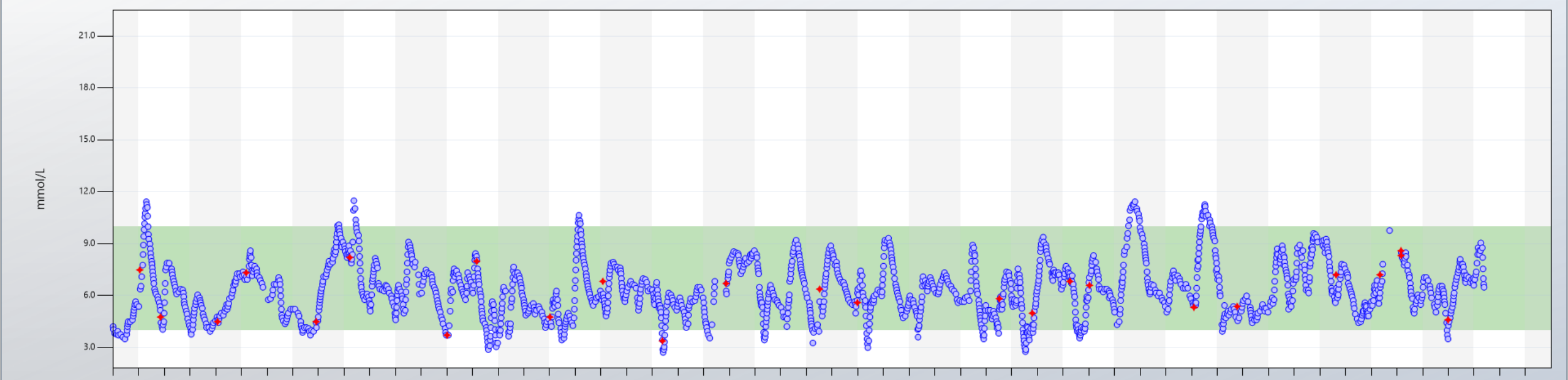
Home Patterns Hourly Stats Daily Trends Distribution **Glucose Trend** Daily Stats Success Report A1c Records Patients Options

Glucose Trend
Cursor Position: Friday, October 13, 2017 12:00 AM
Selected Dates: Friday, October 13, 2017 to Thursday, October 26, 2017

Ignore Display Time Adjustments
Print Daily Strips Print Report
View Daily Strips View Report

14 [Navigation icons]

Glucose Trend : , [SM44926205]



○ Sensor ◆ Meter 🍞 Carbs 📝 Insulin 🏃 Exercise + Health

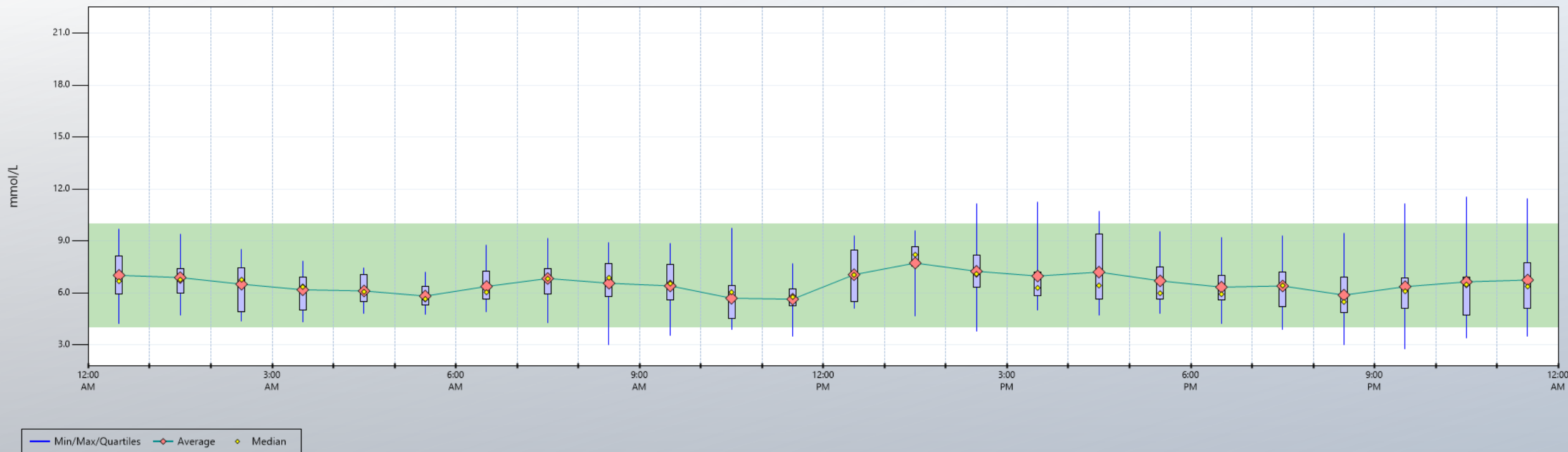
Home Patterns Hourly Stats Daily Trends Distribution Glucose Trend Daily Stats Success Report A1c Records Patients Options

Hourly Stats from Friday, October 20, 2017 to Thursday, October 26, 2017.
With all days of the week. ## With all times of the day. ## With all glucose values.

Print Report
View Report

7

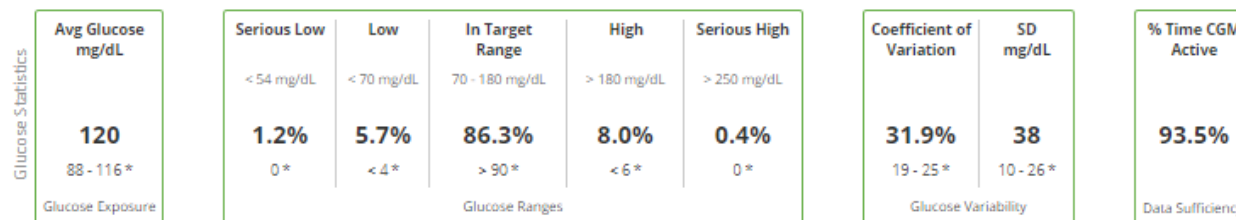
Hourly Stats : , [SM44926205]



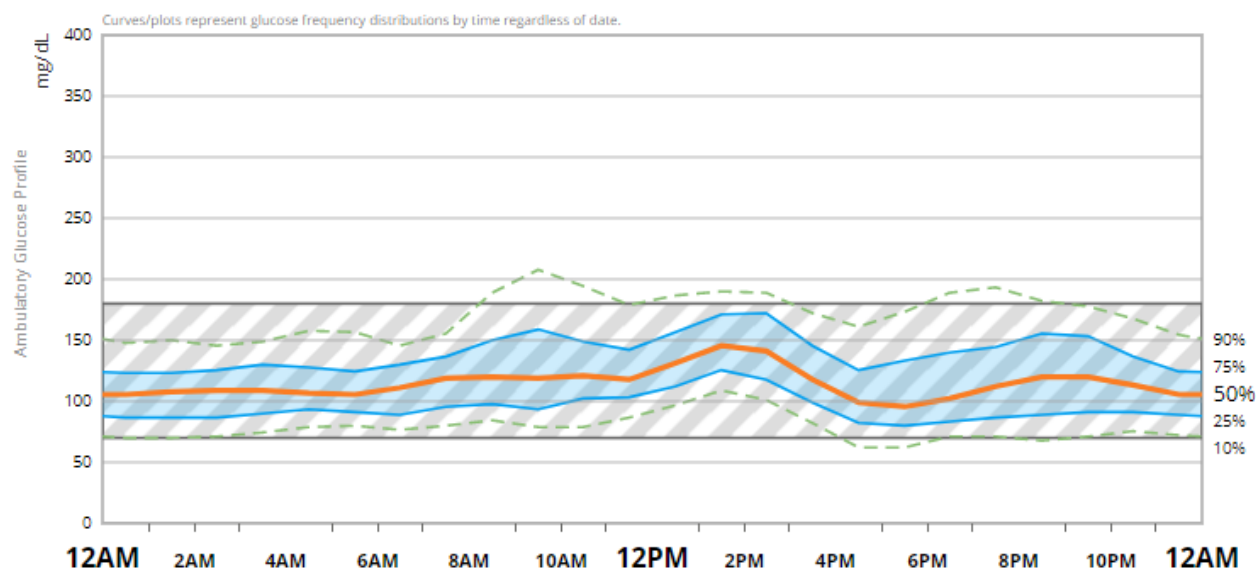
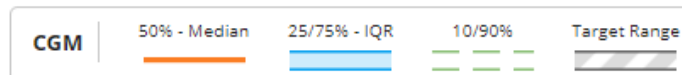
Statistic	Totals	12am	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm
# of Readings	1723	84	84	84	84	84	84	79	83	71	60	61	55	61	69	72	68	71	67	58	69	64	71	71	69
Average	6.57	7.03	6.89	6.51	6.19	6.12	5.83	6.38	6.84	6.57	6.41	5.70	5.65	7.06	7.73	7.26	6.98	7.21	6.71	6.34	6.41	5.88	6.37	6.65	6.75
Min	2.77	4.22	4.72	4.38	4.33	4.83	4.77	4.94	4.27	3.00	3.55	3.88	3.50	5.11	4.66	3.77	4.99	4.72	4.83	4.22	3.88	3.00	2.77	3.39	3.50
Quartile 25	5.49	5.94	5.98	4.94	5.04	5.49	5.33	5.66	5.94	5.77	5.60	4.55	5.27	5.49	7.55	6.33	5.83	5.66	5.63	5.60	5.22	4.87	5.13	4.74	5.11
Median	6.38	6.69	6.77	6.77	6.35	6.08	5.66	6.05	6.83	6.88	6.55	6.05	5.77	7.05	8.21	7.10	6.30	6.44	5.99	5.94	6.44	5.49	6.10	6.49	6.38
Quartile 75	7.38	8.13	7.38	7.44	6.94	7.05	6.38	7.24	7.38	7.69	7.63	6.44	6.22	8.49	8.66	8.17	7.21	9.41	7.49	6.99	7.21	6.91	6.88	6.94	7.77
Max	11.54	9.71	9.38	8.55	7.82	7.44	7.21	8.77	9.16	8.93	8.88	9.77	7.71	9.32	9.60	11.1	11.2	10.7	9.54	9.21	9.32	9.43	11.1	11.54	11.43
Std. Dev.	1.58	1.49	1.21	1.28	1.06	0.78	0.68	0.97	1.09	1.59	1.57	1.17	1.00	1.52	1.44	1.89	1.90	1.92	1.49	1.28	1.48	1.64	2.18	2.39	2.14
Est. Std. Dev.	1.40	1.62	1.04	1.85	1.41	1.15	0.78	1.17	1.07	1.42	1.50	1.40	0.70	2.22	0.82	1.37	1.03	2.78	1.38	1.03	1.48	1.51	1.30	1.62	1.97

Ambulatory Glucose Profile

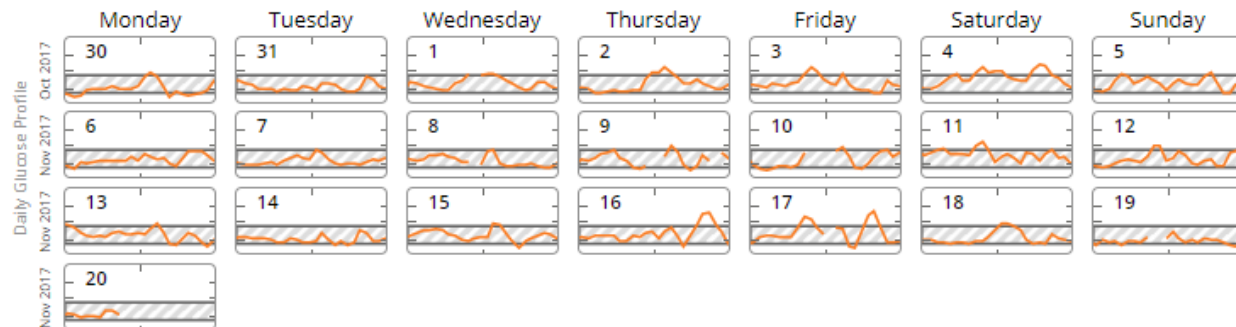
- standardizované zobrazení dat z CGM



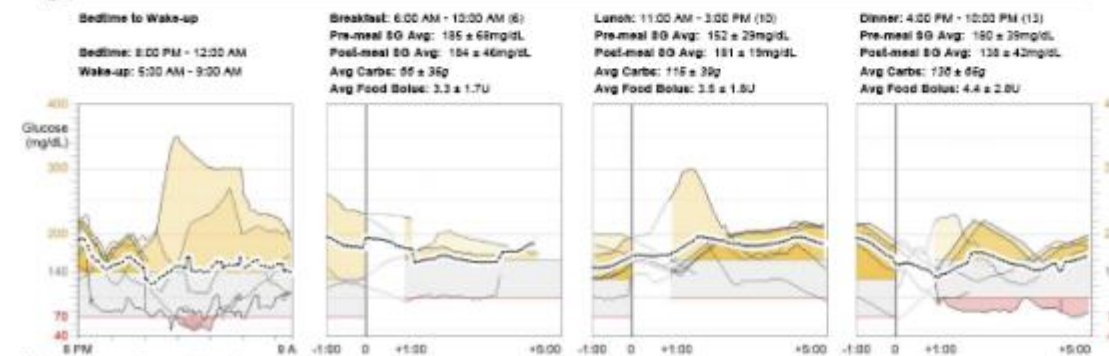
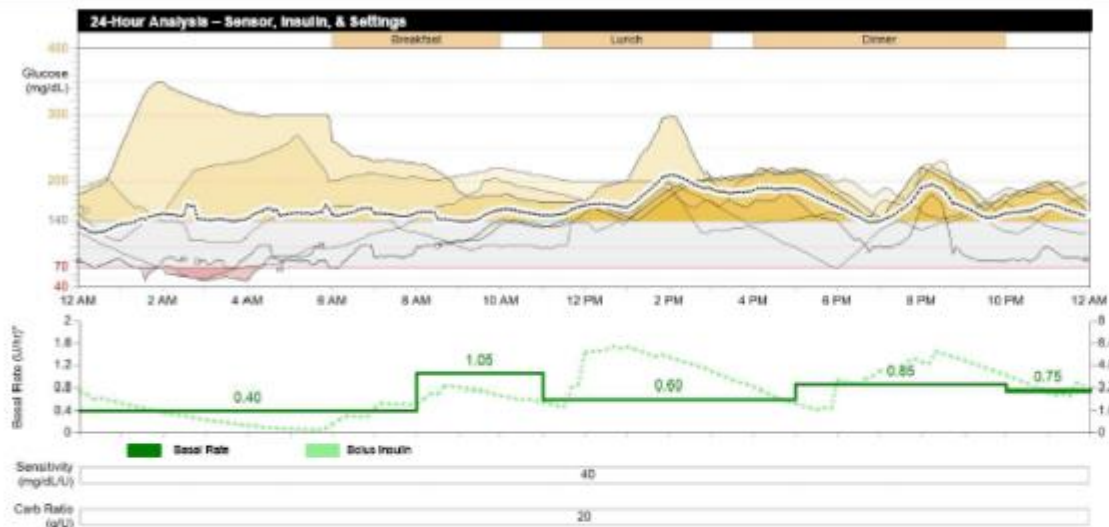
* Reference ranges calculated from population without diabetes. Glucose Range reference values based on a target range of 70 - 180 mg/dL.



The Y axis and target range are the same as on the Ambulatory Glucose Profile graph above.



Carelink Pro



Statistics	
Avg BG	153 ± 56mg/dL
Estimated A1C	7.2%
BG Readings	5.3 per day
Carbs Entered	332 ± 67g per day

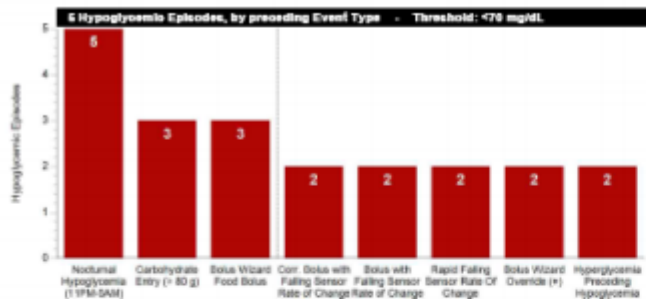
Hypoglycemic Patterns (1)	
Time Period	1:20 AM-4:20 AM (5)

Hyperglycemic Patterns (7)**	
Time Period	1:15 PM-6:45 PM
Time Period	11:30 AM-1:05 PM
Time Period	7:10 PM-12:00 AM

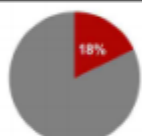
Pump Use	Per Day
Insulin TDD	36.5 ± 5.4U
Basal/Bolus Ratio	45 / 52
Manual Boluses	0.7U (0.2 boluses)
Bolus Wizard	18.1U (3.3 boluses)
Food	13.9U (3.3 boluses)
Correction	1.1U (1.2 boluses)
Override (+)	1.2U (0.9 boluses)
Override (-)	0.0U (0.0 boluses)
Suspend Duration	7m per day
Res./Site Change	Every 5.2 days / Never

Sensor Use	
Avg BG	159 ± 59 mg/dL
Wear Duration	2d 12h per week
Low BG Alarms	0.0 per day
High BG Alarms	0.0 per day

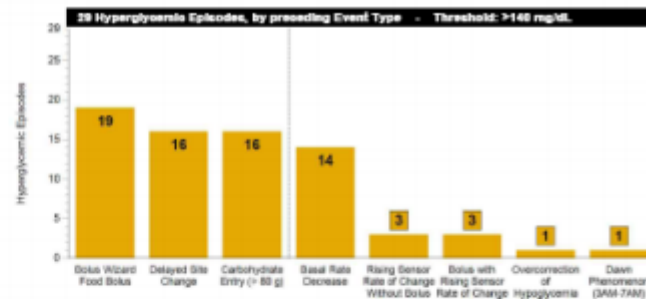
** Only highest priority shown.



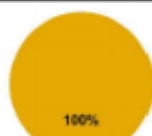
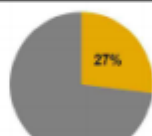
Most Common Event Types preceding Hypoglycemia



Event Type	%	Description
Nocturnal Hypoglycemia (11PM-5AM)	100	Consider assessing overnight basal rates and counseling your patient on evening boluses.
Carbohydrate Entry (> 80 g)	80	Consider counseling your patient on the effect of high carbohydrate intake.
Bolus Wizard Food Bolus	80	Consider assessing the Bolus Wizard settings, counseling your patient on accurate carbohydrate counting, and/or the timing of insulin delivery with respect to carbohydrate intake.



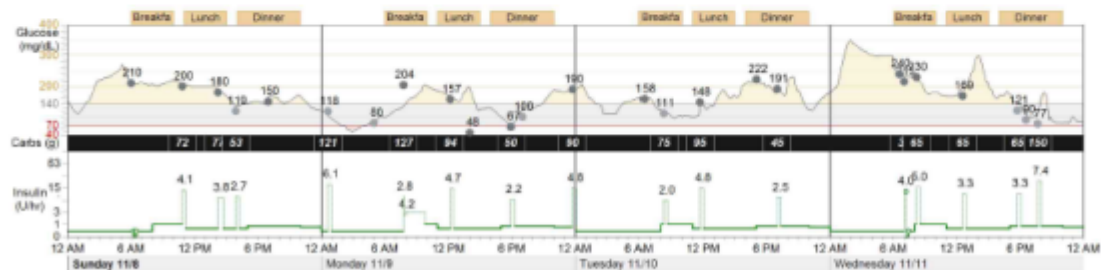
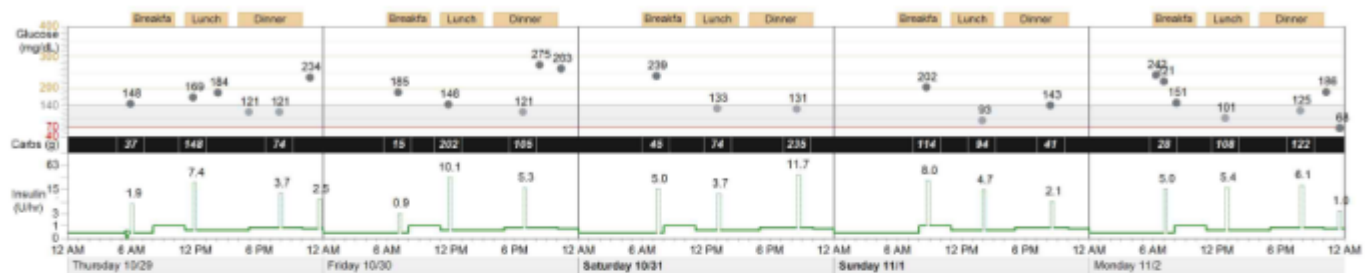
Most Common Event Types preceding Hyperglycemia



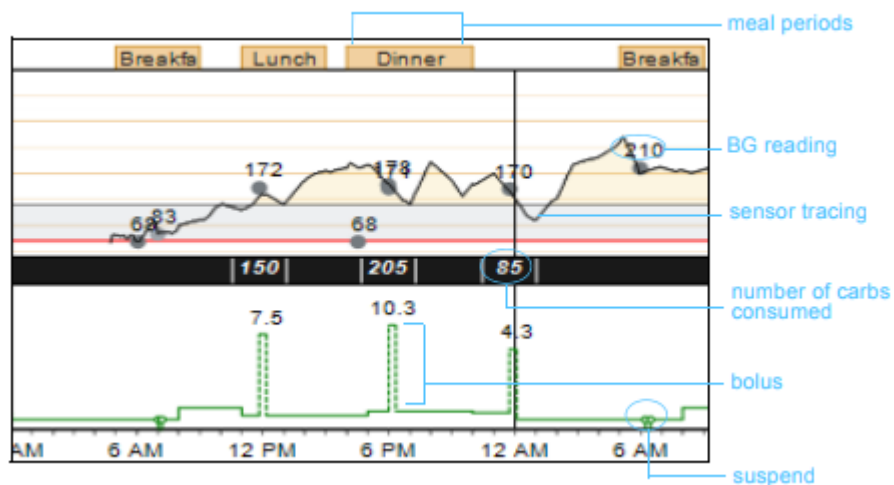
Event Type	%	Description
Bolus Wizard Food Bolus	88	Consider assessing the Bolus Wizard settings, counseling your patient on accurate carbohydrate counting, and/or the timing of insulin delivery with respect to carbohydrate intake.
Delayed Site Change	88	Consider counseling your patient on the proper frequency of infusion site changes and to use fixed primes / cannula fills when changing sites.
Carbohydrate Entry (> 80 g)	66	Consider counseling your patient on the effect of high carbohydrate intake.

Other Observations

Infusion Site Change	Consider counseling your patient on changing infusion sites a minimum of every three days or review the correct way to change an infusion site with the patient.
Sensor Wear	Consider counseling your patient on the benefits of more frequent sensor use.



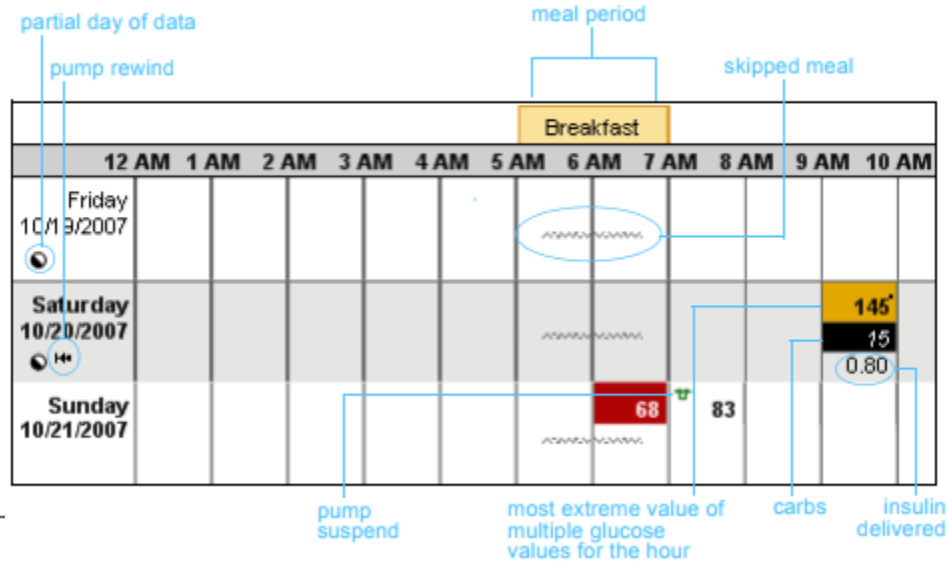
Sensor trace
 BG reading
 Basal
 Bolus
 Suspend
 Time change
 Exercise
 Interrupted
 Off chart
 Temp basal
 Injected insulin (U)
 Other





	Breakfast			Lunch			Dinner			Daily Totals																
	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM		
Thursday 10/29/2009						148 37 1.90							189 148 7.40		184			121		121 74 3.70			234 2.20	Average (6): 163mg/dL Carbs: 259g Insulin: 33.1U Bolus: 47%		
Friday 10/30/2009							185 15 0.90						148 202 10.10							121 105 5.30		275		263	Average (5): 108mg/dL Carbs: 322g Insulin: 36.5U Bolus: 45%	
Saturday 10/31/2009							239 45 5.00								133 74 3.70							131 235 11.70			Average (3): 108mg/dL Carbs: 354g Insulin: 38.5U Bolus: 63%	
Sunday 11/1/2009									202 114 8.00						93 94 4.70								143 41 2.10			Average (3): 146mg/dL Carbs: 249g Insulin: 31.1U Bolus: 48%
Monday 11/2/2009						242 221 151 28 5.00							101 108 5.40									125 122 6.10		186 68 1.00	Average (7): 156mg/dL Carbs: 259g Insulin: 32.5U Bolus: 54%	
Tuesday 11/3/2009						68 83							172 150 8.80						178 171 11.80					170 85 4.90	Average (6): 140mg/dL Carbs: 440g Insulin: 41.3U Bolus: 62%	
Wednesday 11/4/2009						68 83							172 150 8.80						178 171 11.90					170 85 4.90	Average (6): 140mg/dL Carbs: 440g Insulin: 41.3U Bolus: 62%	
Thursday 11/5/2009																										Average (0): -- Carbs: -- Insulin: -- Bolus: --
Friday 11/6/2009										145 15 0.80			118 74 3.70								81 95 4.80				Average (4): 120mg/dL Carbs: 164g Insulin: 23.2U Bolus: 40%	
Saturday 11/7/2009						68 83							172 150 7.50					68 178 171						170 85 4.30	Average (7): 130mg/dL Carbs: 440g Insulin: 41.3U Bolus: 54%	
Sunday 11/8/2009						210							200 72 4.10			180 119 7.7 3.80 2.70							150	Average (5): 172mg/dL Carbs: 202g Insulin: 28.7U Bolus: 37%		
Monday 11/9/2009	118 121 0.10				80			204 127 7.00					157 94 4.70		48					67 50 2.20				190 90 4.80	Average (8): 121mg/dL Carbs: 482g Insulin: 44.3U Bolus: 56%	
Tuesday 11/10/2009						158			111 75 2.00				148 95 4.80							222 222				191 45 2.50	Average (5): 106mg/dL Carbs: 215g Insulin: 28.8U Bolus: 33%	
Wednesday 11/11/2009							240 215 230 32 4.00						169 65 3.30							121 65 3.30				90 77 150 7.40	Average (7): 163mg/dL Carbs: 377g Insulin: 39.9U Bolus: 58%	

 > 140mg/dL
 00 Multiple readings (most extreme shown)
 ⊞ Suspend
 ♥ Exercise
 ⊙ Partial day
 ⌚ Time change





Basal	
Maximum Basal Rate	35.00 U/hr
Temp Basal Type	Insulin Rate (U/hr)

Standard (active)	Pattern A	Pattern B
24-Hour Total 15.70 U	24-Hour Total 66.80 U	24-Hour Total 197.20 U

TIME	U/hr	TIME	U/hr	TIME	U/hr
0:00	0.40	0:00	1.85	0:00	8.50
8:00	1.05	5:30	3.05	11:30	6.80
11:00	0.60	12:00	3.25	17:30	10.20
17:00	0.65	18:00	3.30	22:30	5.10
22:00	0.75	22:00	2.05		

Bolus	
Maximum Bolus	25.0 U
Dual/Square (Variable)	On
Blood Glucose Reminder	Off

Easy (Audio) Bolus	On
Entry (Step)	0.50 U

Bolus Wizard	On
Units	g, mg/dL
Active Insulin Time (h:mm)	8:00
Insulin Concentration	--

Missed Bolus Reminder	
Start (h:mm)	End (h:mm)
--	--

Carbohydrate Ratio (g/U)

TIME	Ratio
0:00	20.0

Insulin Sensitivity (mg/dL per U)

TIME	Sensitivity
0:00	40

Blood Glucose Target (mg/dL)

TIME	Low	High
0:00	80	180

Notes

Sensor	
Sensor	On
Transmitter ID	1234567
BG Units	mg/dL

Glucose Alerts			
TIME	Low (mg/dL)	High (mg/dL)	Alert Repeat
0:00	80		0:05

Predictive Alert	--
Low High (mins)	-- --

Rate Alert: Fall Rise (mg/dL/min)	-- --
-------------------------------------	---------

AUC Limit: Low High (mg/dL)	-- --
-------------------------------	---------

Missed Data/Weak Signal (h:mm)	0:05
--------------------------------	------

Graph Timeout (h:mm)	--
----------------------	----

Auto Calibration	--
Calibration Reminder (h:mm)	Off

Calibration (Alert) Repeat (h:mm)	0:05
-----------------------------------	------

Utilities	
Alert Type	Beep Short
Low Reservoir Warning	Time
Amount	22:00

Bolus	
Maximum Bolus	10.0 U
Dual/Square (Variable)	On
Blood Glucose Reminder	Off

Easy (Audio) Bolus	On
Entry (Step)	1.00 U

Bolus Wizard	Off
Units	g, mmol/L
Active Insulin Time (h:mm)	4:00
Insulin Concentration	--

Missed Bolus Reminder	
Start (h:mm)	End (h:mm)
6:00	8:00
11:30	13:00

Standard (active)

24-Hour Total	15,20 U
---------------	---------

TIME	U/hr
0:00	0,30
6:00	1,00
14:00	0,60
22:00	0,30

Pattern A

24-Hour Total	12,00 U
---------------	---------

TIME	U/hr
0:00	0,40
9:00	0,60
18:00	0,50

Pattern B

24-Hour Total	--
---------------	----

TIME	U/hr
--	--

Hypoglycemic Episode Event Types			
Event Type	Description (as shown in report)	How CareLink Pro identifies this Event Type	
Basal Rate Increase	Consider assessing your patient's basal rate settings, including temporary basal rates.	Defined as a basal rate increase of 25% or more from the previous rate.	Reported when it correlates with hypoglycemic episodes that start within 3 hours following the rate change.
Bolus with Falling Sensor Rate of Change	Consider counseling your patient to modify bolus amounts when sensor glucose values are falling (downward arrow is present).	Defined as a bolus that was delivered while sensor glucose was falling (at some point falling more than 1.5 mg/dL per minute/0.083 mmol/L per minute).	Reported when it correlates with hypoglycemic episodes that start within 3 hours following the bolus.
Bolus Wizard Food Bolus	Consider assessing the Bolus Wizard settings, counseling your patient on accurate carbohydrate counting, and/or the timing of insulin delivery with respect to carbohydrate intake.	Defined as a Bolus Wizard event where carbohydrates were entered, resulting in an insulin recommendation where a portion is due to food.	Reported when it correlates with hypoglycemic episodes that start within 3 hours following the bolus.
Bolus Wizard Override (+)	Consider counseling your patient to use the Bolus Wizard recommendations.	Defined as a Bolus Wizard bolus where the user delivered more than the recommended amount of insulin.	Reported when it correlates with hypoglycemic episodes that start within 3 hours following the bolus.
Carbohydrate Entry (> 80 g)/ Carbohydrate Entry (> 5.3 ex)	Consider counseling your patient on the effect of high carbohydrate intake.	Defined as a carbohydrate entry greater than 80 grams/5.3 exchanges (a Bolus Wizard entry or event meal marker).	Reported when it correlates with hypoglycemic episodes that start within 3 hours following the carbohydrate entry.
Corr. Bolus with Falling Sensor Rate of Change	Consider counseling your patient to modify correction bolus amounts when sensor glucose values are falling (downward arrow is present).	Defined as a correction bolus that was delivered while sensor glucose was falling (at some point falling more than 1.5 mg/dL per minute/0.083 mmol/L per minute).	Reported when it correlates with hypoglycemic episodes that start within 3 hours following the bolus.

Hypoglycemic Episode Event Types		
Event Type	Description (as shown in report)	
Basal Rate Increase	Consider assessing your patient's basal rate settings, including temporary basal rates.	Defin or m
Bolus with Falling Sensor Rate of Change	Consider counseling your patient to modify bolus amounts when sensor glucose values are falling (downward arrow is present).	Defin while some per m

Diabetický deník

Papírový

	Breakfast			Lunch			Dinner			Bedtime		Night	Comments
	Blood Sugar Before	Insulin Units/ Type	Blood Sugar After	Blood Sugar Before	Insulin Units/ Type	Blood Sugar After	Blood Sugar Before	Insulin Units/ Type	Blood Sugar After	Blood Sugar Before	Insulin Units/ Type	Blood Sugar	
Mon													
Tues													
Wed													
Thurs													
Fri													
Sat													
Sun													

Elektronická verze pro tisk

27.1.	INZULÍN					MOČ		GLYKÉMIE						
	rychlý			depotní		cukry	ketony	nízká		zvýšená		vysoká		
Datum	snídaně		oběd		večer		ráno	snídaně	svačina	oběd	svačina	1. večeře	2. večeře	v noci
pondělí	4,5	0	4	0,5	10,5	2	0	9,6		14,5		8,8	13,8	
úterý	4,5	0	3,5	1,5	11	2	0	10,0	10,5	11,7		10,2	15,5	10,0
středa	4,5	0	3,5	1	11	2	0	5,9		10,2		5,5	11,7	
čtvrtek	4,5	0	3	2	11	2	0	7,3	6,3	2,9		11,3	11,3	
pátek	4	0	2,5	2	11	2	0	4,5	4,3	4,9	5,2	6,4	11,9	
sobota	4	0	2,5	2,5	10,5	1	0	4,9	3,2	4,9		9,8	9,4	
neděle	3,5	0	3	3	10,5	1	0	6,9	4,8	10,8		14,3	15,1	

JÍDLO výměnné jednotky						CELKEM JEDNOTEK		POZNÁMKY
snídaně	svačina	oběd	svačina	1. večeře	2. večeře	inzulín	jídlo	
4	3	6	3	6	3	19,5	25	Např. hypoglykémie
4	3	6	3	6	3	20,5	25	2. večeře + 0,5 Ac
4	3	6	3	6	3	20	25	
4	3	7	3	6	3	20,5	26	HP (14:00) - 150 ml Kofoly
4	3	6	3	6	3	19,5	25	
4	3,5	6	3	6	3	19,5	25,5	
4	3	6	3	6	3	20	25	

Desktopové aplikace

Show day part report by 7 days period. [Previous Period](#) 09/18/2012 — 09/24/2012 [Next Period](#)

Show tracker entries notes

Entries of Trackers

- All trackers
- Blood Glucose
- Comments
- Vitamins plus Aspirin
- LANTUS
- HydroChloroThiazide
- Zetia
- Atenolol
- PRAVASTATIN
- NOVOLOG
- LOSARTAN
- Resting Heart Rate (Pulse)
- Blood pressure systolic/di
- Weight
- Exercises
- Food

Entries with Labels

- All labels
- After dinner
- Before lunch
- After lunch
- Before breakfast
- Before bed
- After snack

Days/Parts	00:01 am – 6 am	6 am – 9 am	9 am – 12 noon	12 noon – 3 pm	3 pm – 6 pm	6 pm – 9 pm
Mon 09/24/2012	2:00AM Snack Carbs: 26g 2:50AM Blood Glucose: 244mg/dL After dinner, After snack 2:55AM NOVOLOG: 5UNITS After dinner 3:00AM LANTUS: 8UNITS Before bed	7:49AM Blood Glucose: 129mg/dL Before breakfast	9:53AM HydroChloroThiazide: -1Tab 24mg 10:30AM Breakfast Carbs: 24g 10:41AM shopped: 15 min 47kcal		2:30 Lunch C 72g	
Sun 09/23/2012	12:53AM Blood Glucose: 260mg/dL After dinner, After snack 1:00AM HydroChloroThiazide: -1Tab 24mg 2:57AM LANTUS: 8UNITS Before bed		10:54AM Blood Glucose: 144mg/dL Before lunch	12:5 NOVOLC 5UNITS dinner, A snack	1:57 Blood Glucose 143mg/d lunch	
Sat 09/22/2012	12:48AM Blood Glucose: 208mg/dL After dinner				1:00 Lunch C 33g	

Deník diabetika

ODBER ZPRÁVODAJE
Registrovat | Přihlásit se

DENÍK DIABETIKA ŽIVOT S DIABETEM NOVINKY PORADNA LÉKAŘE SOUTĚŽ

Chcete si snadno a přehledně vést diabetický deník? [Přihlašte se](#) nebo [se registrujte](#).

PŘIDAT ZÁZNAM

09.11.2016	13:17	5
09.11.2016	13:07	5.8
Dobrá práce. Vidíš, jak je jednoduché sledovat svůj glykemický profil!		7.0

NEJČTENĚJŠÍ

MÁM DIABETES. TAKŽE CO MI VLASTNĚ JE?

DESET NEJČASTĚJŠÍCH MÝTŮ O CUKROVCE

ČTYŘI TIPY, JAK ZABRÁNIT ROZVOJI CUKROVKY 2....

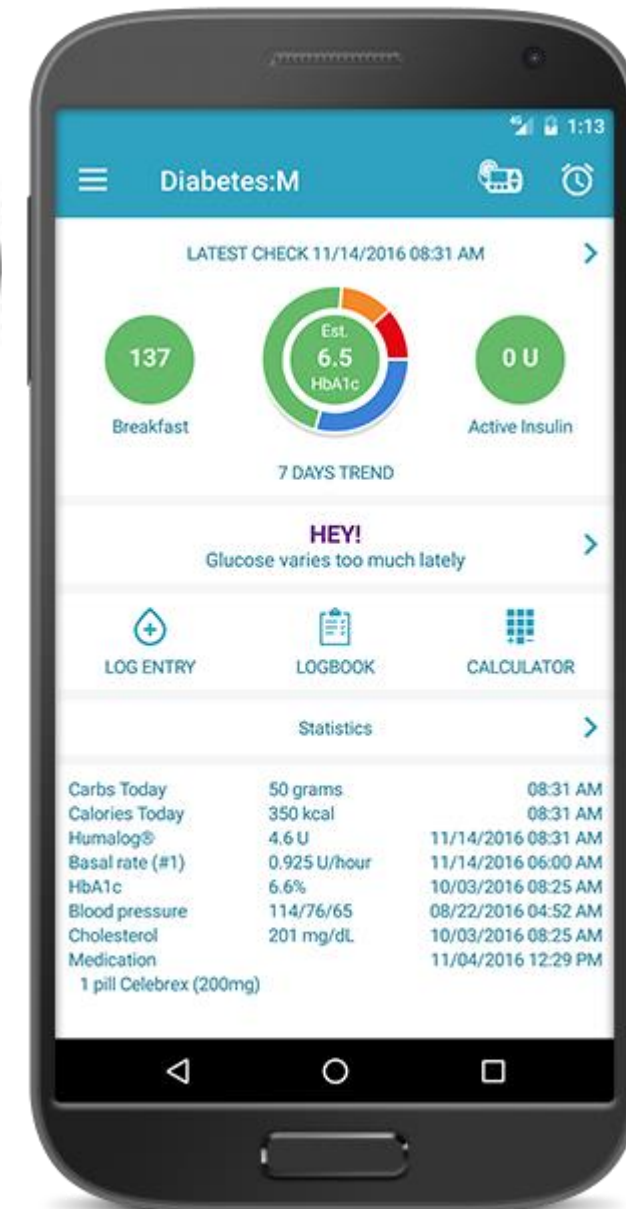
KDYŽ TĚLO PRÁCI S INZULINEM NEZVLÁDÁ, MÁ ČLOVĚK...

MÁTE CUKROVKU? NEPODCEŇUJTE SVOJÍ VÁHU!

Mobilní aplikace

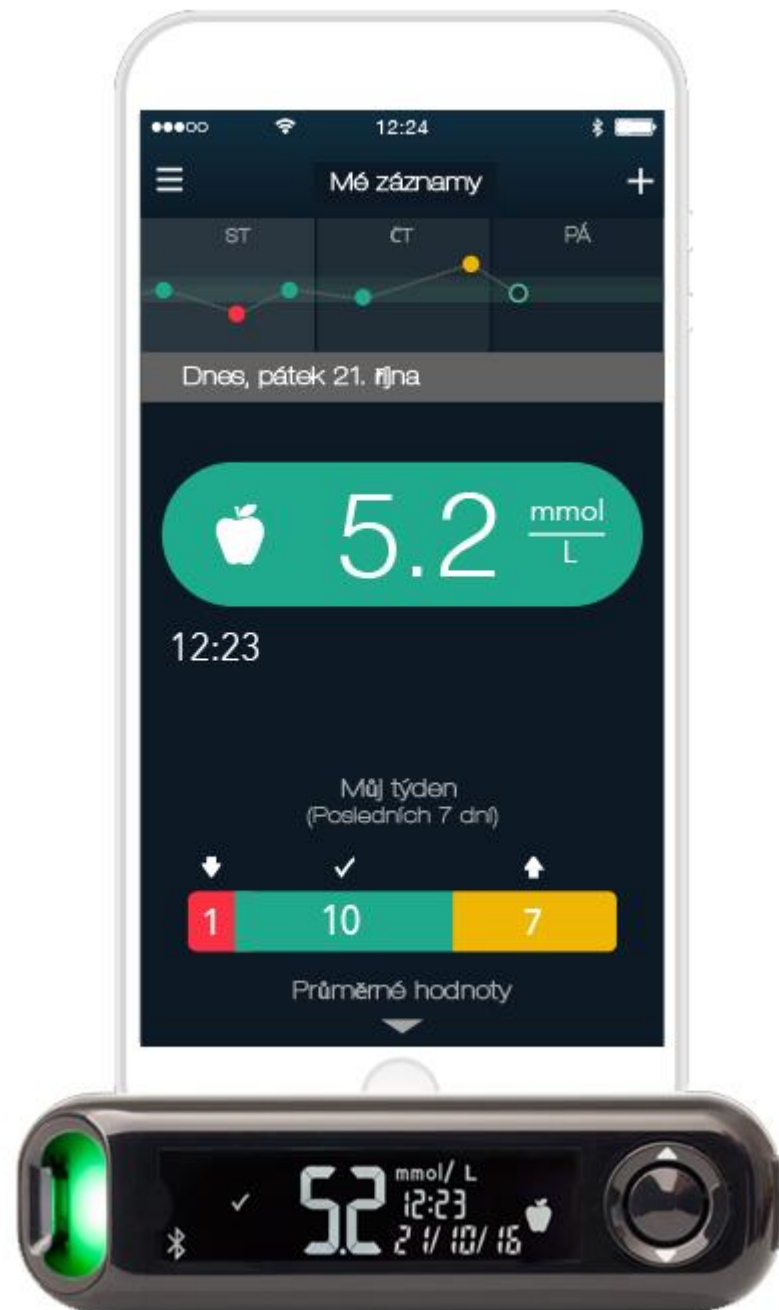
Diabetes:M

- glykémie, jídlo (sacharidy, kalorie), medikace (bolus i bazál, typ), pohyb, HbA1c, váha
- bolusový kalkulátor
- databáze potravin
- zobrazení aktivního inzulinu
- označení míst vpichu
- podrobné statistiky
- export/import dat (csv, xls) z externích zdrojů (carelink, dexcom, Libre, OneDrop, Accucheck,...)
- propojení s Google Fit, Fitbit, Nightscout
- propojení s hodinkami Android Wear



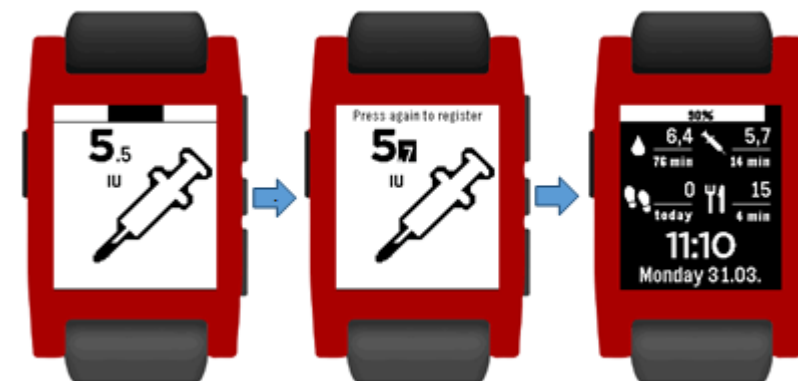
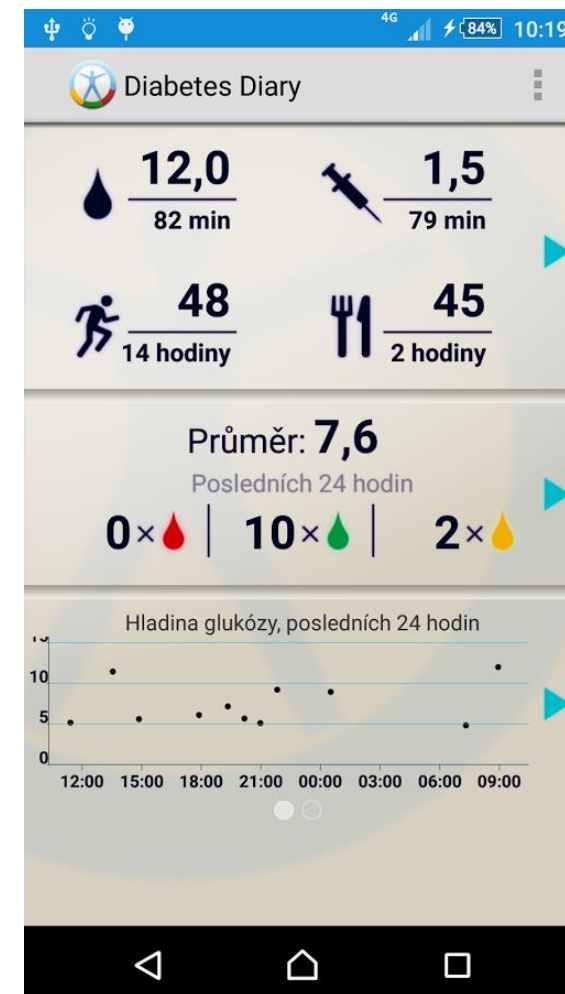
Contour Diabetes

- použití POUZE v kombinaci s glukometrem Contour Plus One – synchronizace dat
- glykémie, jídlo, medikace, pohyb
- Android/iOS



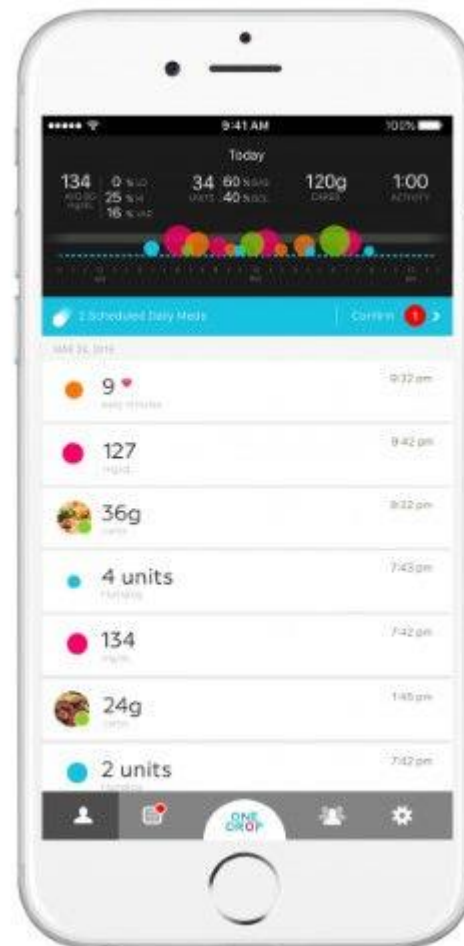
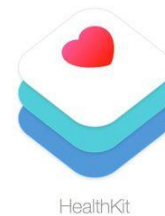
Diabetesdagboka

- glykémie, sacharidy, kalorie, inzulín, orální léky, váha
- synchronizace dat z glukometru FORA Diamond Mini
- databáze potravin
- propojení s aplikací Runkeeper
- propojení s Pebble hodinkami
- základní statistiky z glykémie
- export dat (csv)



One Drop

- glykémie, jídlo (+fotka, barcode), medikace (bolus i bazál), pohyb
- Android/iOS
- propojení s:
 - glukometr One Drop
 - Fitbit
 - Google Fit, Health Kit (Apple)



zajímavost: placená verze EXPERT – edukační program od CDE (US)

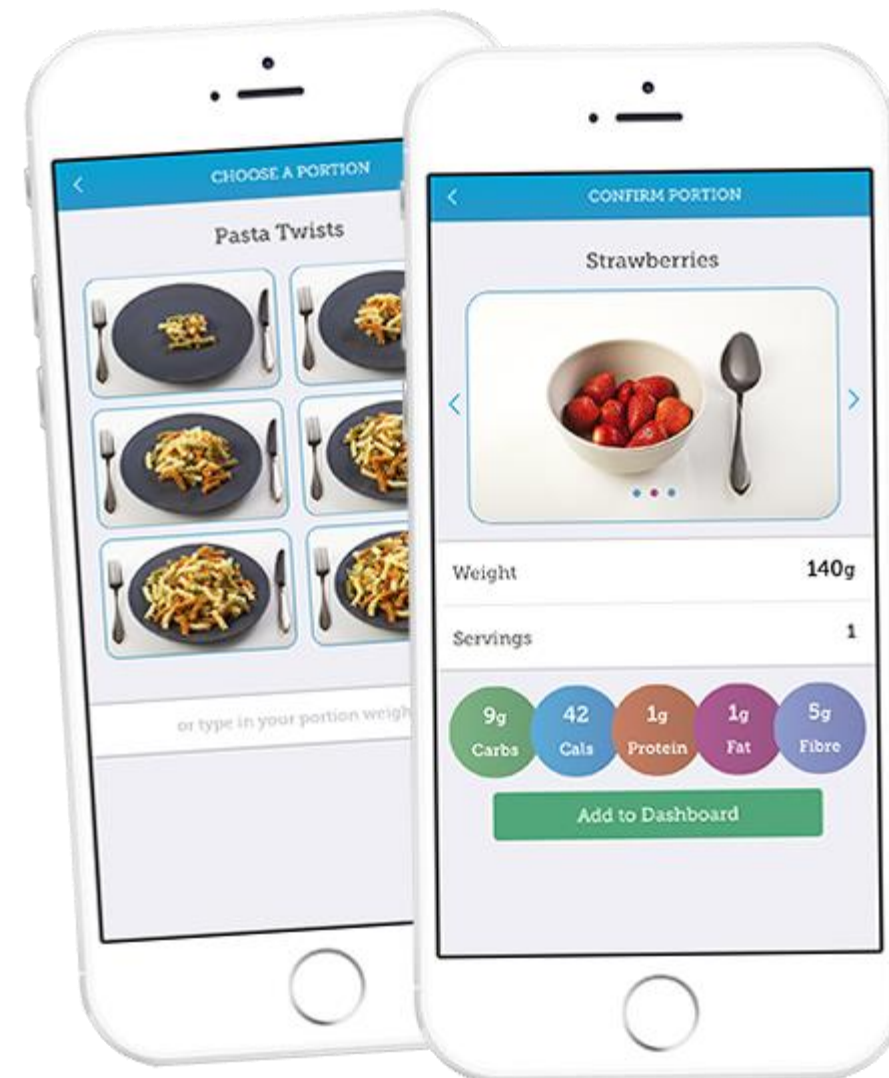
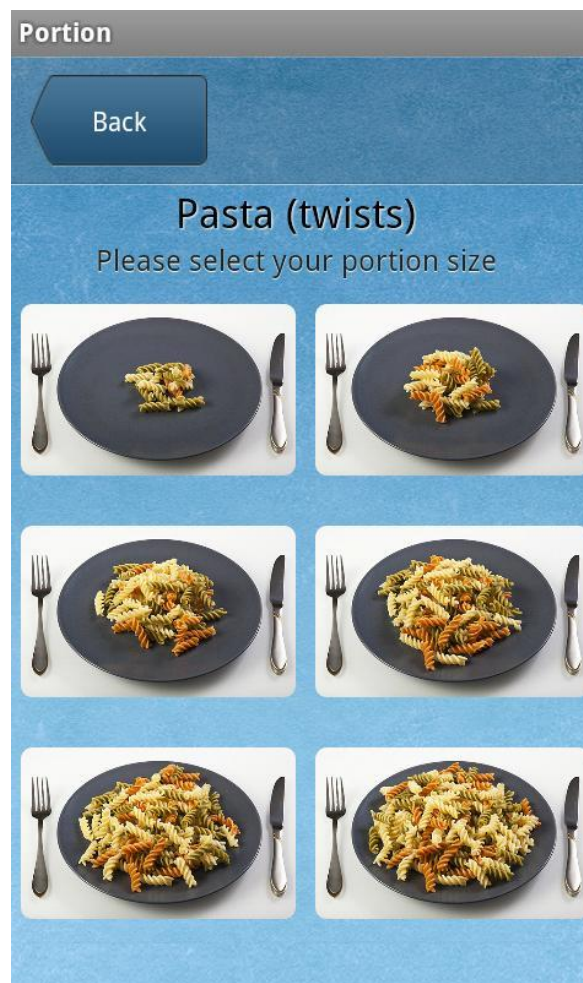
MySugr

- v ČR není dostupná
- verze Basic/Pro (placená)
- synchronizace s glukometrem Accu-chek Guide (Bluetooth)
- synchronizace dat s Apple Health, Google Fit
- glykémie, jídlo, inzulín, fyzická aktivita
- bolusový kalkulátor
- generování reportů
- coaching (CDE)



Carbs&Cals

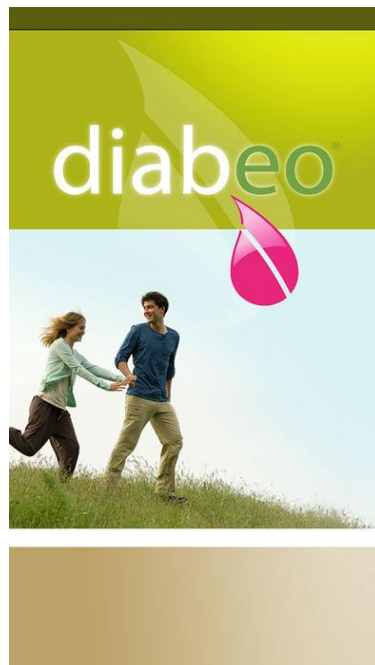
- databáze potravin
- obrázky s různými velikostmi porcí
- nutriční hodnoty



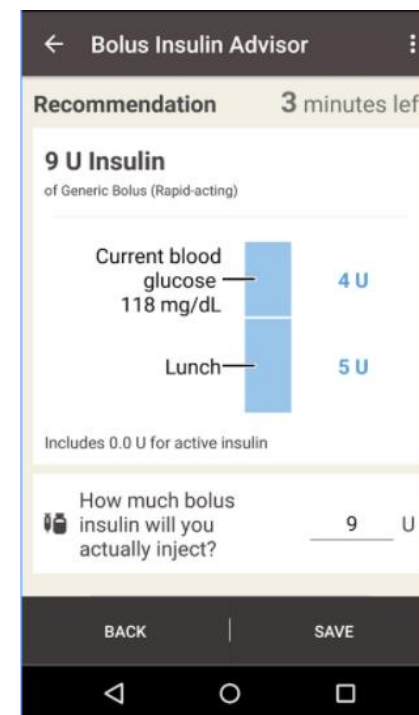
placená
(120CZK)

Bolusový kalkulátor

- mobilní aplikace – vhodné pro pacienty s MDI

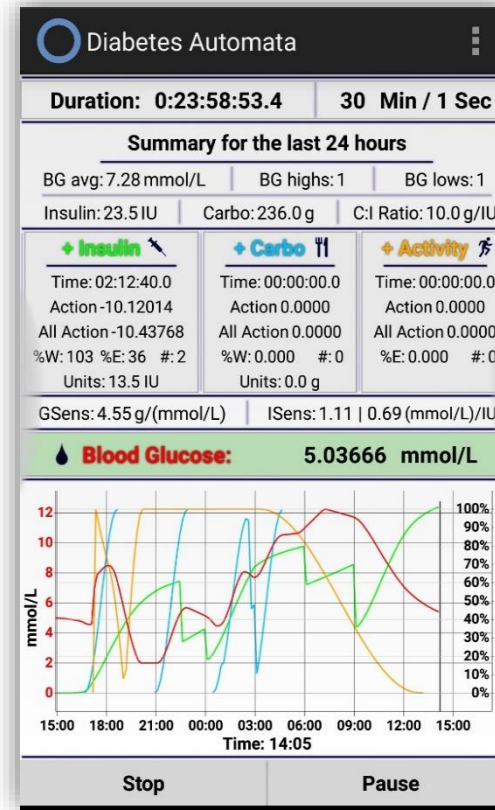
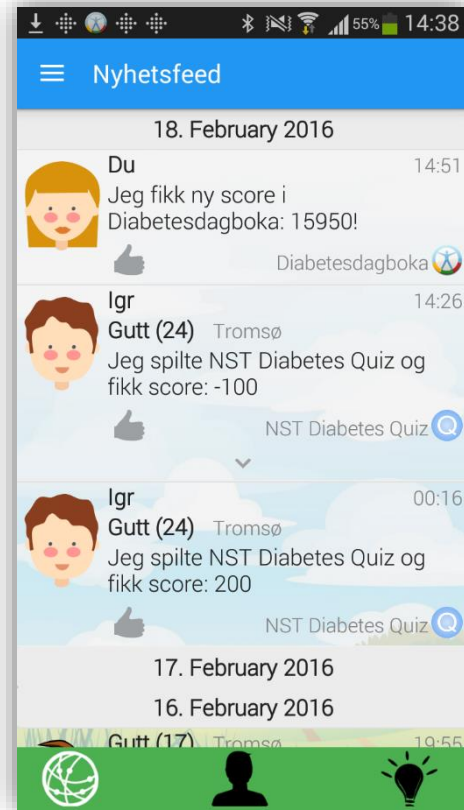


mySugr



Acch-chek connect

Serious Games & Diabetes Apps



- Mobilní aplikace – edukační hry, diabetické deníky,...
- Slouží k:
 - Edukaci pacientů (u serious games zjm. pro dětské pacienty)
 - Motivaci dodržovat správný léčebný režim

1. praktická úloha

Vedení diabetického deníku Diabetesdagboka

Diabetesdagboka

- Stáhněte a nainstalujte si aplikaci diabetického deníku Diabetesdagboka

- Pro splnění prvního úkolu (role pacienta) je požadováno zaznamenávat si do deníku veškeré údaje, které se běžně po pacientovi žádají, tzn. glykémie změřené glukometrem, dávkování inzulínu, množství sněžených sacharidů, pohybovou aktivitu.

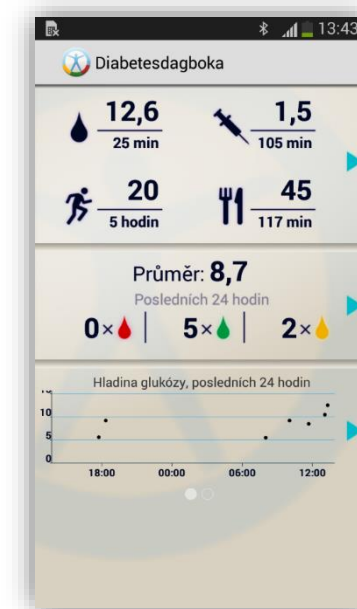
- Požadavky na rozsah:

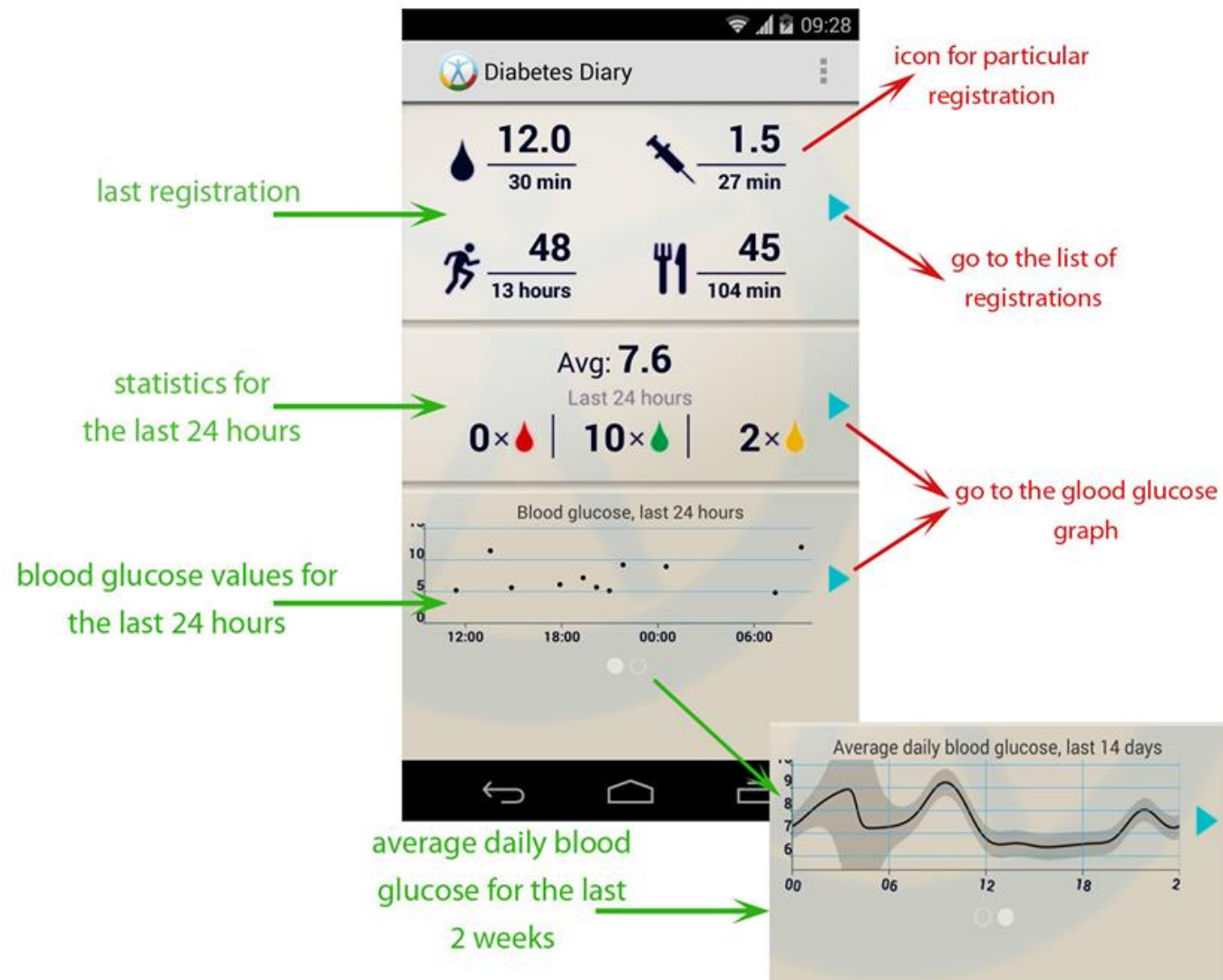
- alespoň **3 dny** s evidencemi záznamů
- **každý ze 3 dnů** bude obsahovat nejméně:
 - **4** záznamy glykémie
 - **3** záznamy jídel s rozepsanou kalkulací počtu sacharidů v poznámce
 - záznam inzulínu adekvátní vůči evidenci sacharidů a glykemií
 - **1** poznámku o fyzické aktivitě (sport, chůze, práce na zahradě,...)

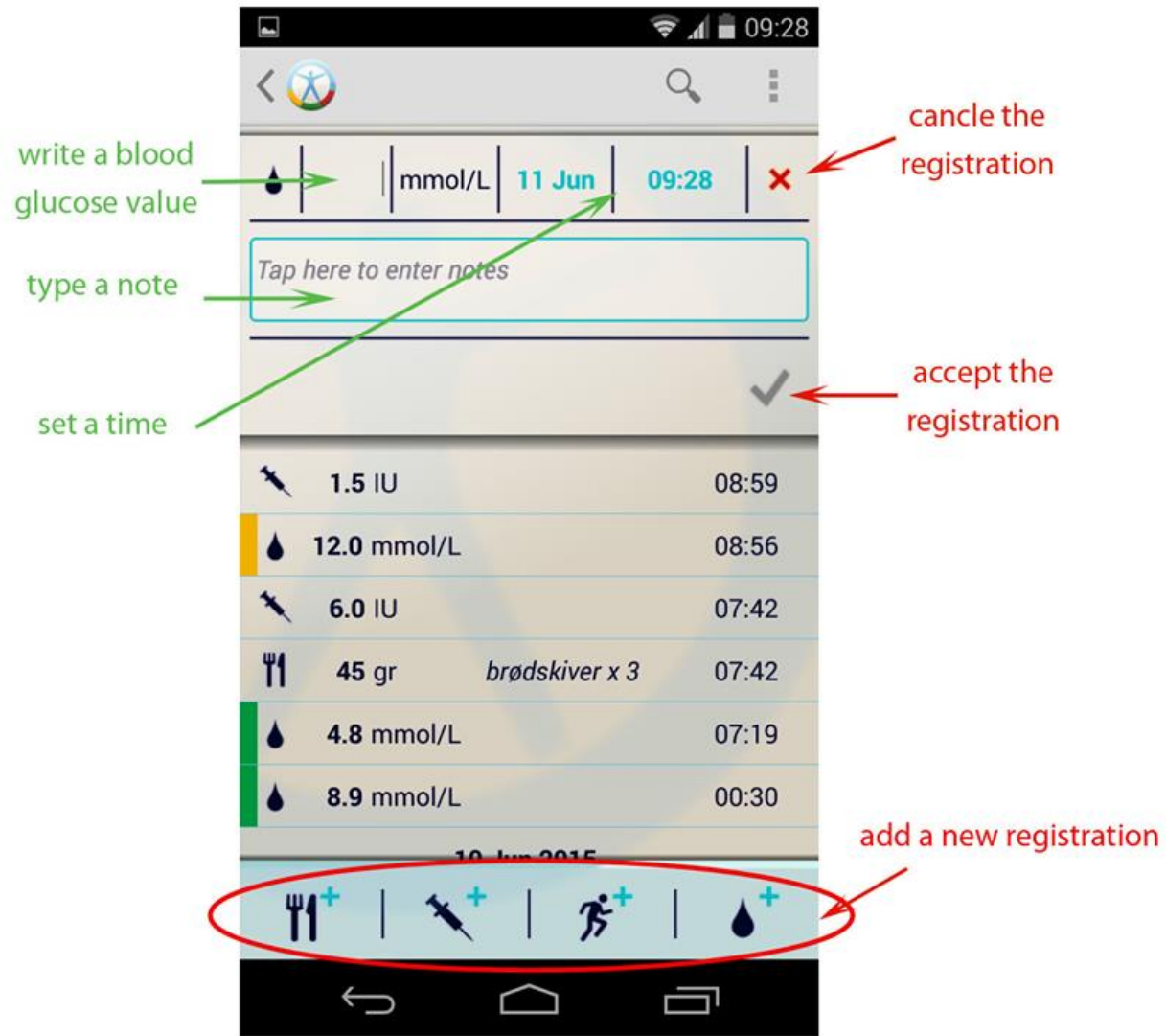
App Store

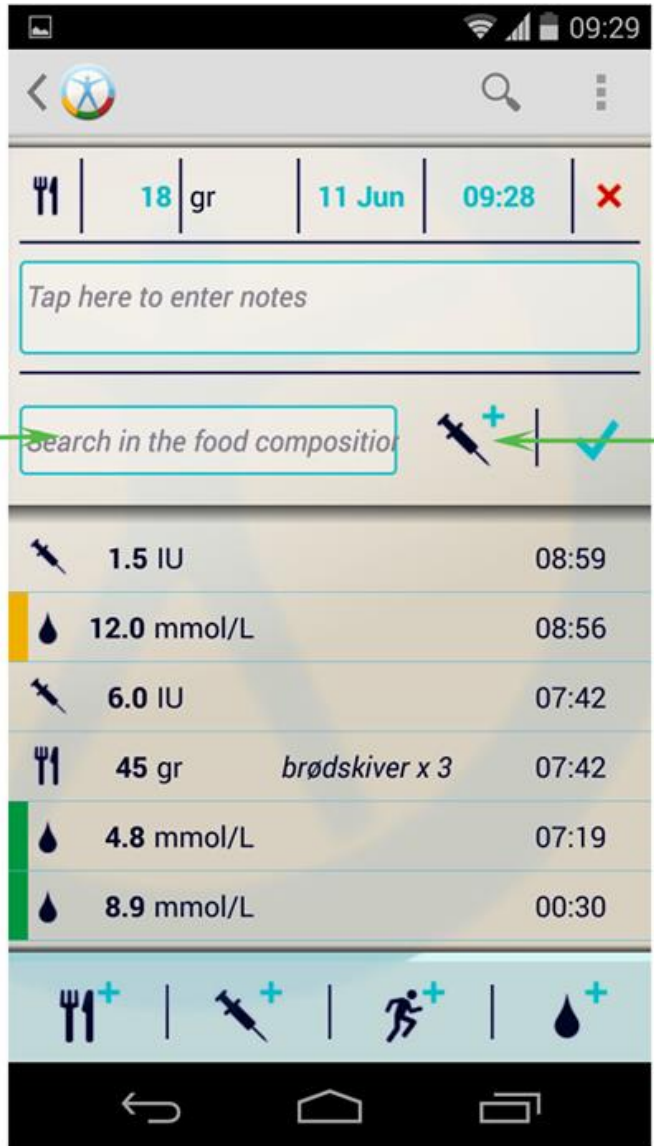


Google Play



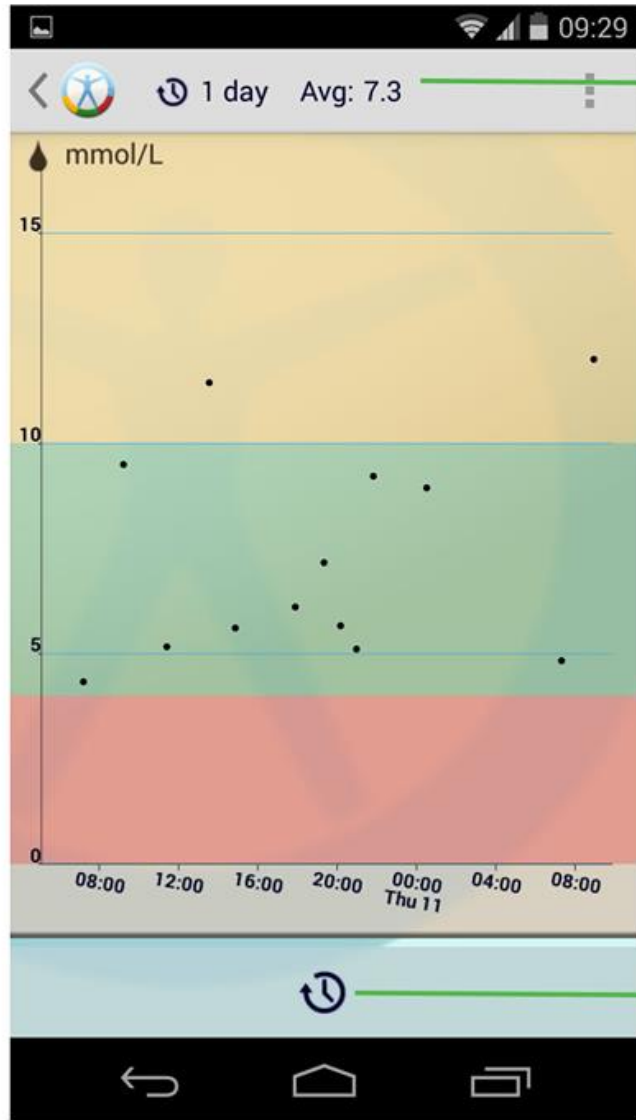






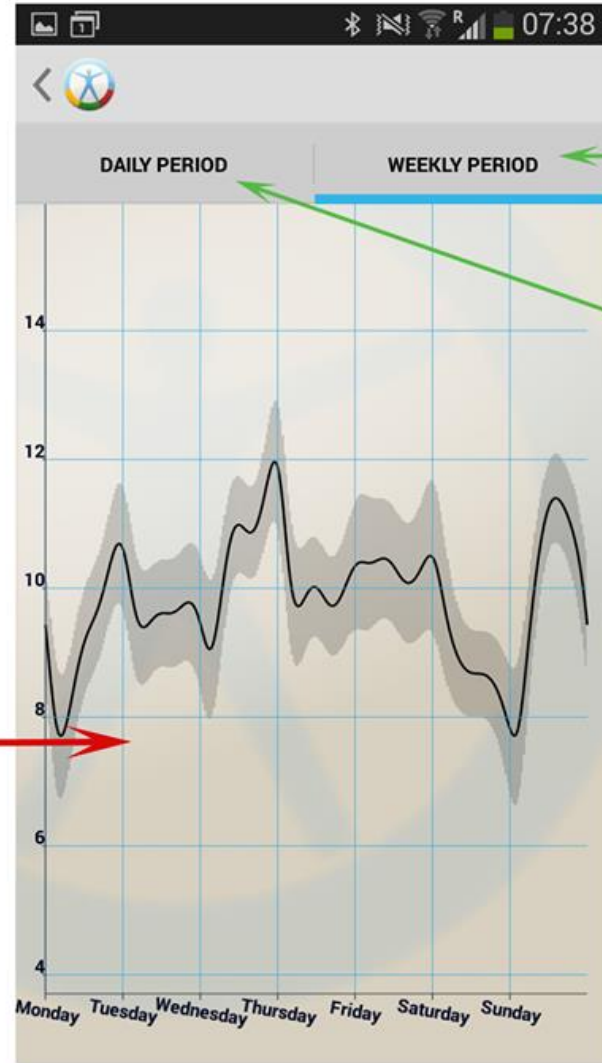
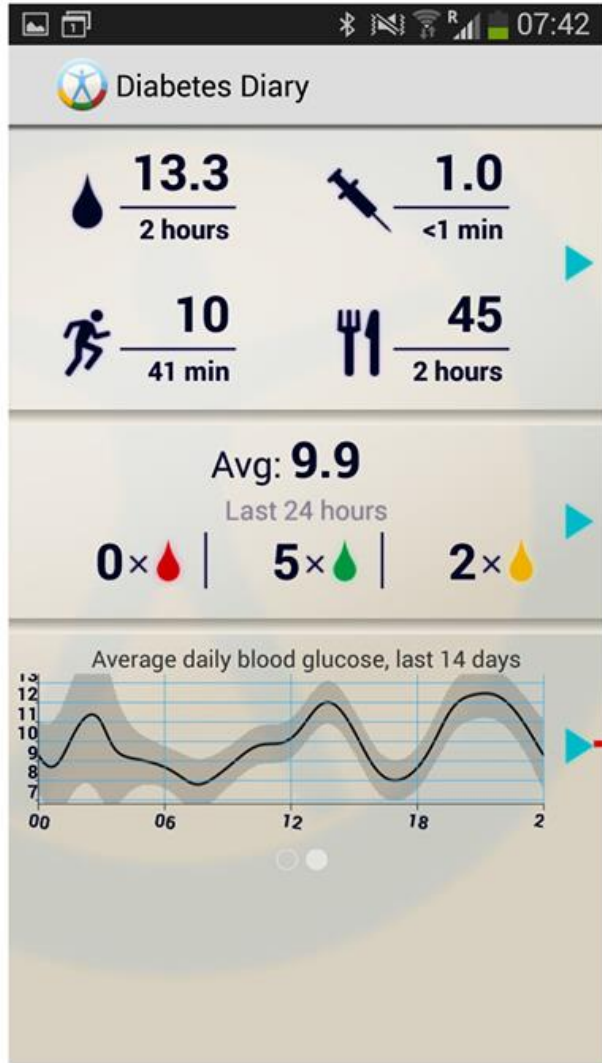
search in the food composition

quick way to move to an insulin registration



the time interval chosen and the average blood glucose

cycle through the display with corresponding time intervals



click to see a weekly period

click to see a daily period



- Funkce hledání podobných situací – pomoc při dávkování inzulínu
- Vyhledá 20 nejpodobnějších situací té, ve které se pacient aktuálně nachází (na základě času, dávky sacharidů, glykémie před jídlem)
- Kliknutím na danou situaci se pacient přenesou do historie záznamů

Similar situations Sorted by relevance					
1	3.0 IU	17:27	→	4.2 mmol/L	18:42
2	3.0 IU	16:07	→	5.8 mmol/L	18:24
3	1.5 IU	17:21	→	9.0 mmol/L	19:30
4	3.0 IU	18:51	→	10.1 mmol/L	20:03
5	5.5 IU	17:17	→	5.8 mmol/L	18:24
6	2.0 IU	17:05	→	10.0 mmol/L	18:19
Situation nr 1: Fri Nov 07. 2014.					
🍴	20 gr	<i>Blåbær,vaniljesau</i>		19:11	
💧	4.2 mmol/L			18:42	
📌	3.0 IU			17:27	
🍴	30 gr	<i>Fisk,potet,grønn...</i>		17:27	
💧	5.4 mmol/L			17:22	
🍴	20 gr	<i>sjokolade</i>		16:28	

Návody

- Facebook: **Diabetesdagboka Czech**, sekce „Poznámky“



The image shows a hand holding a Samsung smartphone displaying the Diabetesdagboka app interface. The app screen shows a glucose level of 5.5, a target range of 5.0, and a trend arrow pointing up. Below this, it shows a glucose level of 20, a target range of 11-40, and a trend arrow pointing down. At the bottom, it shows a glucose level of 6.8, a target range of 1-4, 5-8, and 0-1. The background of the post features the Diabetesdagboka logo and various icons related to diabetes management, such as a person running, a water drop, a fork and knife, and a syringe.

Mobilní aplikace Diabetesdagboka

DIABETESDAGBOKA CZECH · THURSDAY, 11 FEBRUARY 2016 · 64 reads

Diabetesdagboka je skvělý pomocník ve formě aplikace pro chytré mobilní telefony, určený pro snadnější sebekontrolu diabetiků. Aplikace byla vyvinuta Norským centrem pro integrovanou péči a telemedicínu (NST) a o její další vývoj, včetně verze v češtině, se stará spolu s norským týmem i výzkumné centrum Albertov.



Diabetesdagboka

- sacharidy, pohyb – skutečné hodnoty
- inzulín, glykémie – fiktivní (odhadnuté) hodnoty

- **1 výměnná jednotka (v.j.) = 10g sacharidů**
- **10g sacharidů pokryje 1 inzulinová jednotka (IU)**

- u záznamů konzumace sacharidů si do poznámky pište skladbu jídla
- u záznamů fyzické aktivity si můžete psát do poznámky druh aktivity a případně i reakci na léčbu, například, že byste si snížili nebo zvýšili bazální dávku inzulinu, nebo se najedli před/po sportu atp.
- glykémie si zaznamenávejte minimálně **3x denně** (před hlavními jídly) **a před spaním**, navíc můžete i cca 2h po jídle
- hodnoty glykemií si určete na základě vlastního uvážení, můžete se držet například doporučení:
 - lačná glykémie 4-7mmol/l
 - postprandiální glykémie (1-2h po jídle) by měla být v rozmezí 5-9 mmol/l
 - glykémie před jídly a v ostatní dobu 4-7mmol/l

Diabetesdagboka

- Pro **pomoc s počítáním sacharidů** a informací o léčbě a cílových rozmezí lze navštívit například stránky:
- http://www.diacentrum.cz/index.php?option=com_content&task=view&id=59&Itemid=71 (po pravé straně v menu se proklikáte k požadovaným sekcím)
- <http://www.lecbacukrovky.cz/vymenne-jednotky> (zde zjm. odkazy na výměnné jednotky, odhad jídla dle velikosti porce apod.)
- <http://www.kaloricketabulky.cz/> (pro zjištění nutričního složení potravin, můžete si stáhnout i aplikaci do mobilu)
-
- Po dokončení vašeho sběru dat zašlete vaši databázi emailem na adresu holubann@gmail.com nejpozději do **19. 12. 2017**, a to následujícím způsobem:
- v aplikaci Diabetesdagboka v *menu* -> *nástroje* zvolte "**Odeslat databázi**" - pak lze z nabídky soubor buď uložit do požadované složky v telefonu a následně přiložit do zprávy, nebo rovnou zaslat emailem.
- Předmět zprávy formou **ADIATECH: Jméno Příjmení** (tedy například ADIATECH: Anna Holubová)

Děkujeme za pozornost!

Jan Mužík

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Centrum podpory aplikačních výstupů a spin-off firem 1. LF UK

Moderní technologie v diabetologii

Zimní semestr 2017/18