Best Practices in the Time of COVID-19

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Disclosure of Potential Conflicts of Interest

Advisory Boards

- Abbott Diabetes Care
- BioRad
- Lilly
- Mannkind
- Medscape
- NovoNordisk
- Zealand

Research Funding

- Dexcom
- vTv Therapeutics
- Devices from Abbott Diabetes Care

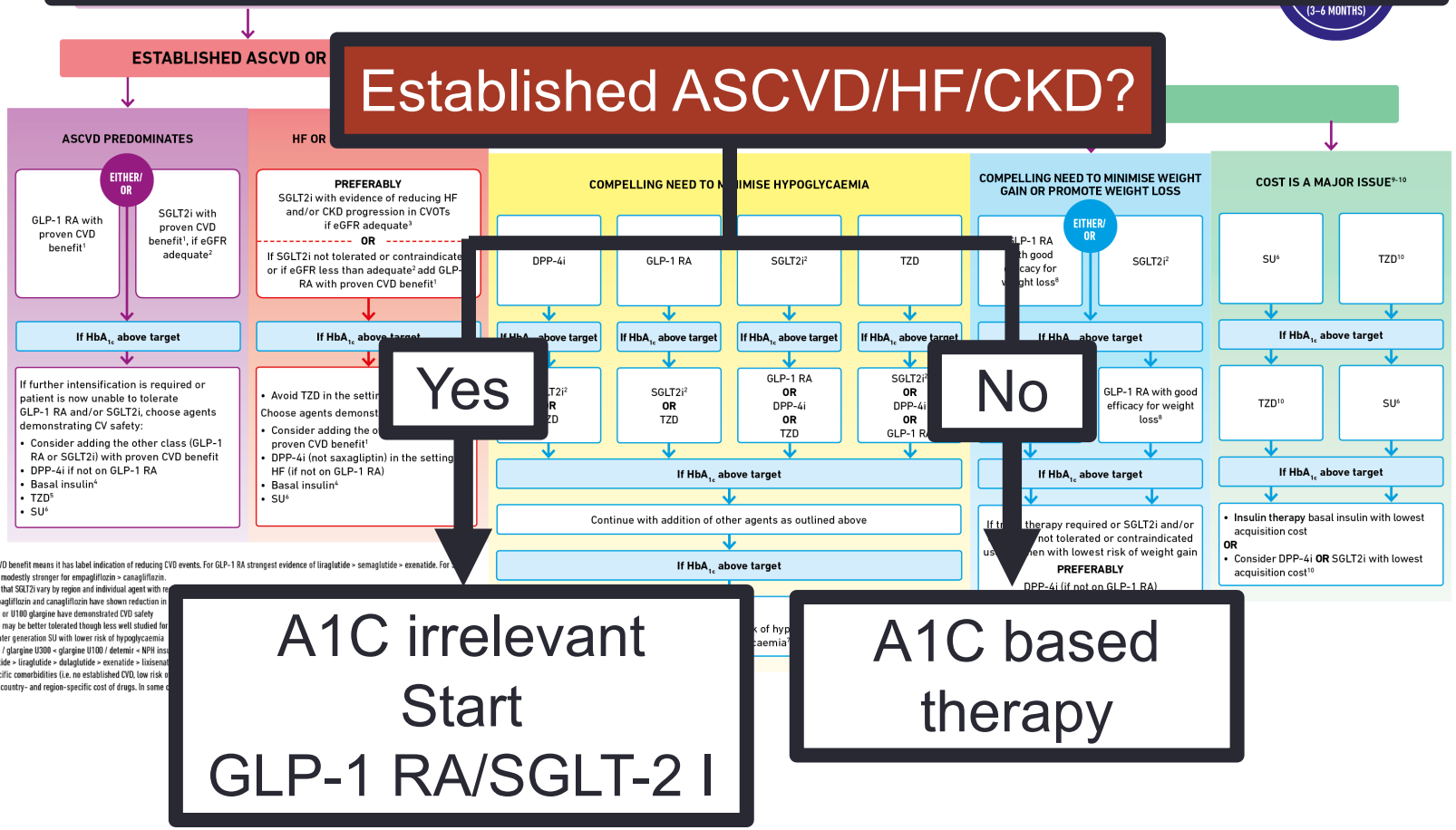
Stock Options

- Pendulum Therapeutics
- Omada Health
- Stability Health
- Livongo

Figure 2

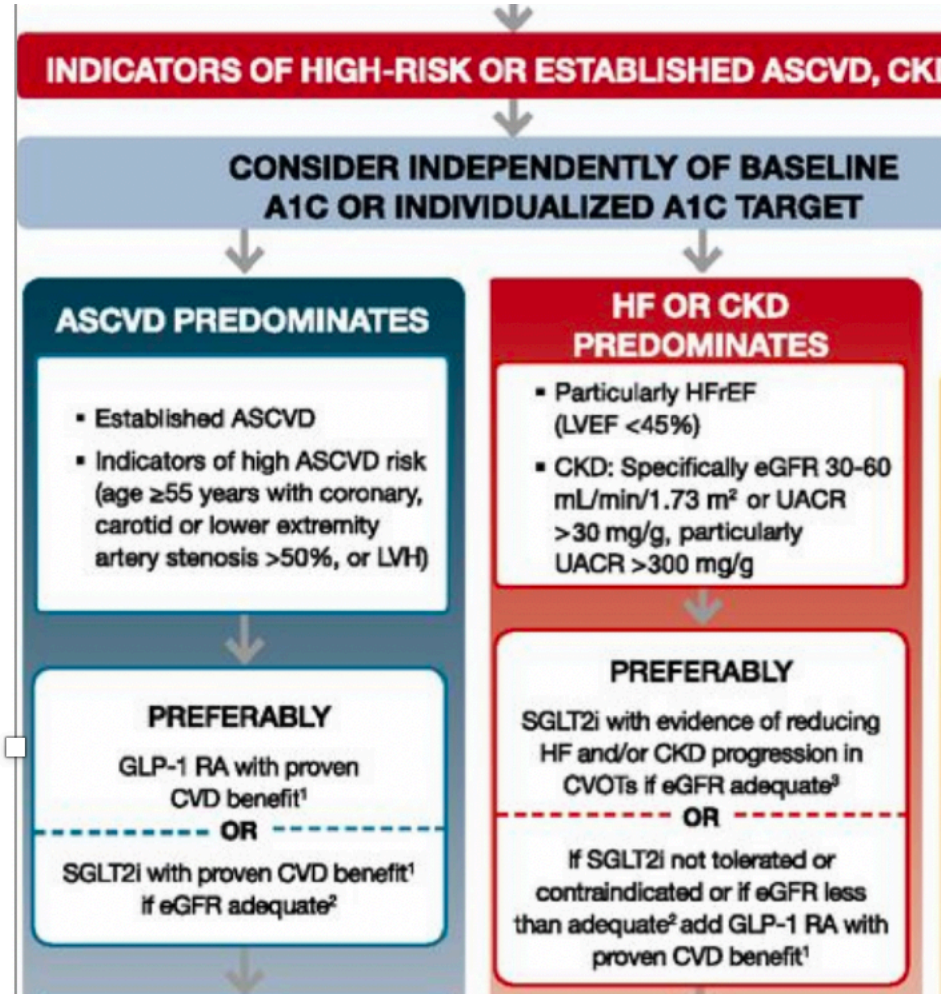
First-line therapy is metformin + lifestyle

If $HbA1_c$ above target proceed as below



1. Proven CVD benefit means it has label indication of reducing CVD events. For GLP-1 RA strongest evidence of liraglutide > semaglutide > exenatide. For evidence modestly stronger for empagliflozin > canagliflozin.
2. Be aware that SGLT2i vary by region and individual agent with re
3. Both empagliflozin and canagliflozin have shown reduction in
4. Degludec or U100 glargine have demonstrated CVD safety
5. Low dose may be better tolerated though less well studied for
6. Choose later generation SU with lower risk of hypoglycaemia
7. Degludec / glargine U300 < glargine U100 / detemir < NPH insu
8. Semaglutide > liraglutide > dulaglutide > exenatide > lixisenat
9. If no specific comorbidities (i.e. no established CVD, low risk o
10. Consider country- and region-specific cost of drugs. In some c

If High-Risk or Established ASCVD, CKD, HF



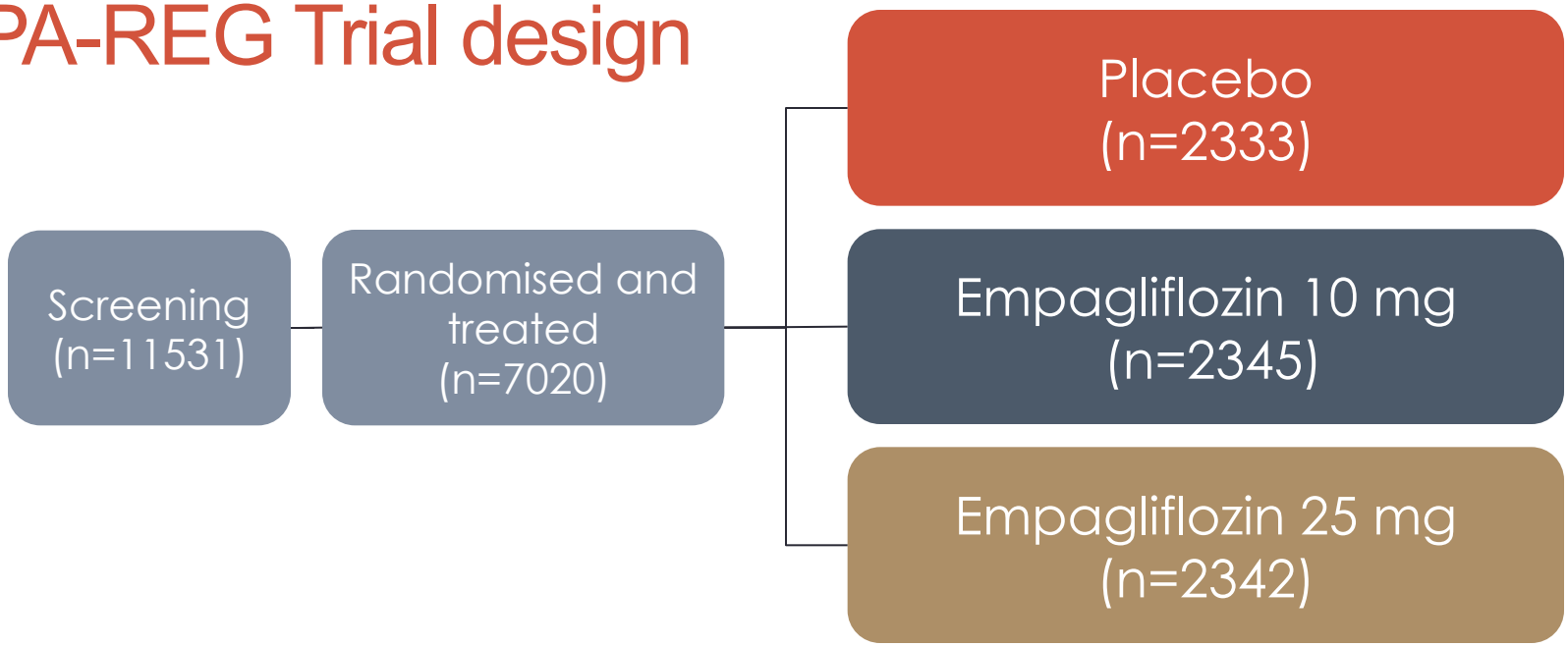
ADA. Diabetes Care 2020 Jan; 43(Supplement 1): S48-S65. https://doi.org/10.2337/dc20-S005

CV Outcomes Trials in Diabetes: SGLT-2 I

Study	EMPA-REG	CANVAS Program	DECLARE-TIMI	VERTIS-CV
SGLT-2 I	empagliflozin	canagliflozin	dapagliflozin	ertugliflozin
N	7028	10,142	17,276	2846
Reported	2015	2017	2018	2020
CVOT Outcome	Benefit	Benefit	Benefit	Noninferior
Renal and HF Outcome	Benefit	Benefit	Benefit	Benefit

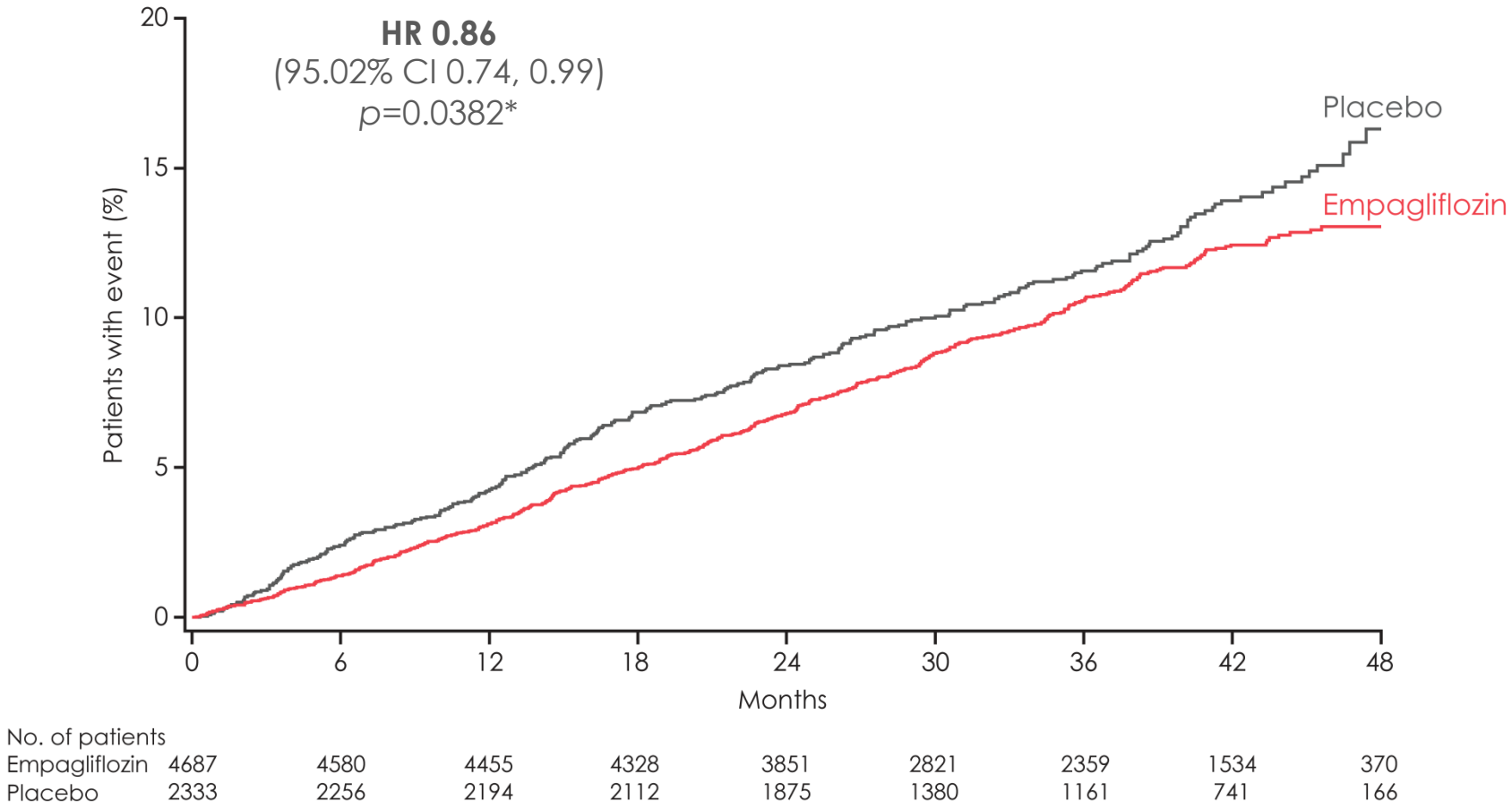
N Engl J Med 2015; 373:2117-2128, N Engl J Med 2017; 377:644-657,

EMPA-REG Trial design



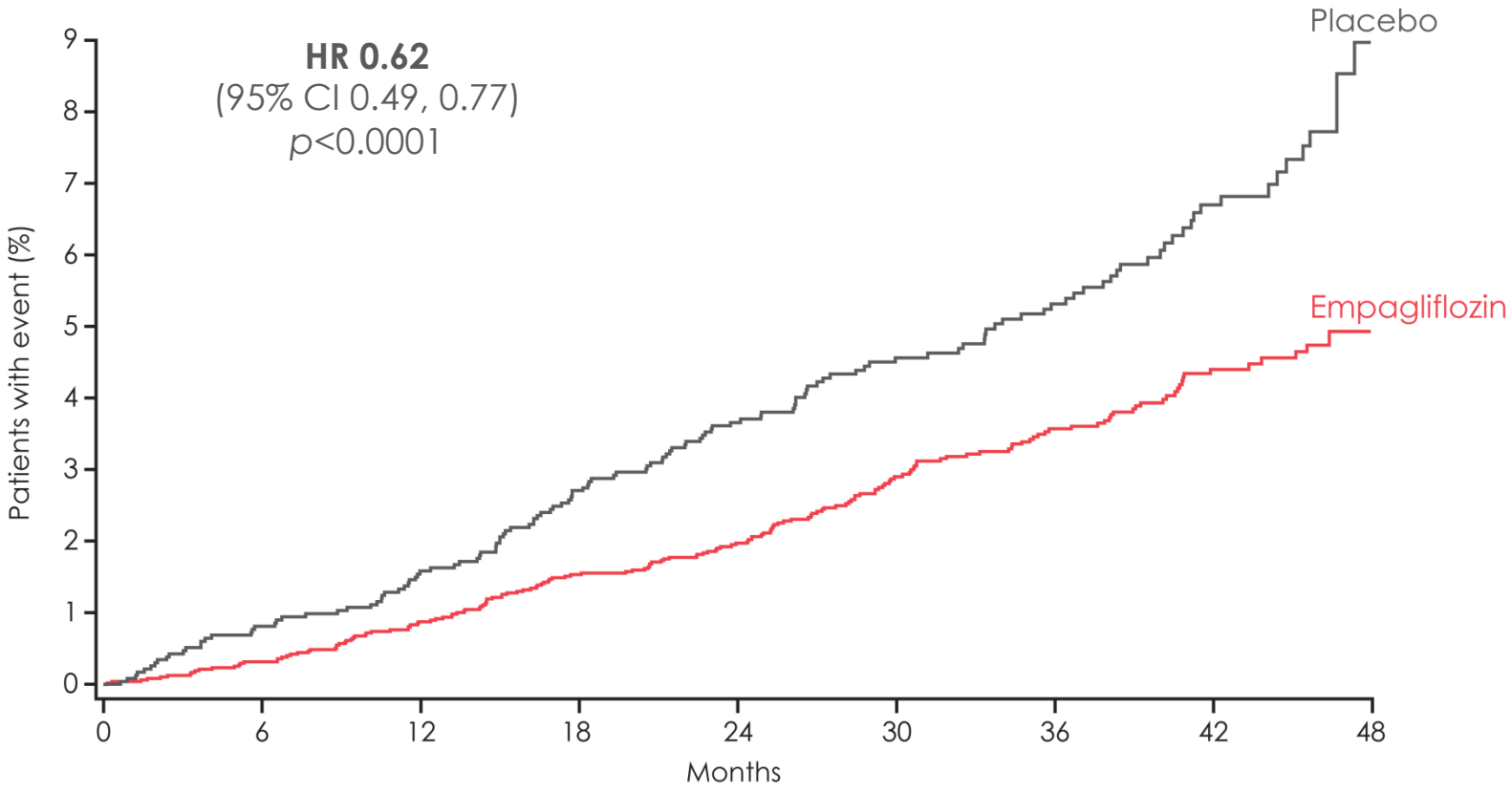
- Study medication was given in addition to standard of care
  - Glucose-lowering therapy was to remain unchanged for first 12 weeks
- Treatment assignment double masked
- The trial was to continue until at least 691 patients experienced an adjudicated primary outcome event

Primary outcome: 3-point MACE



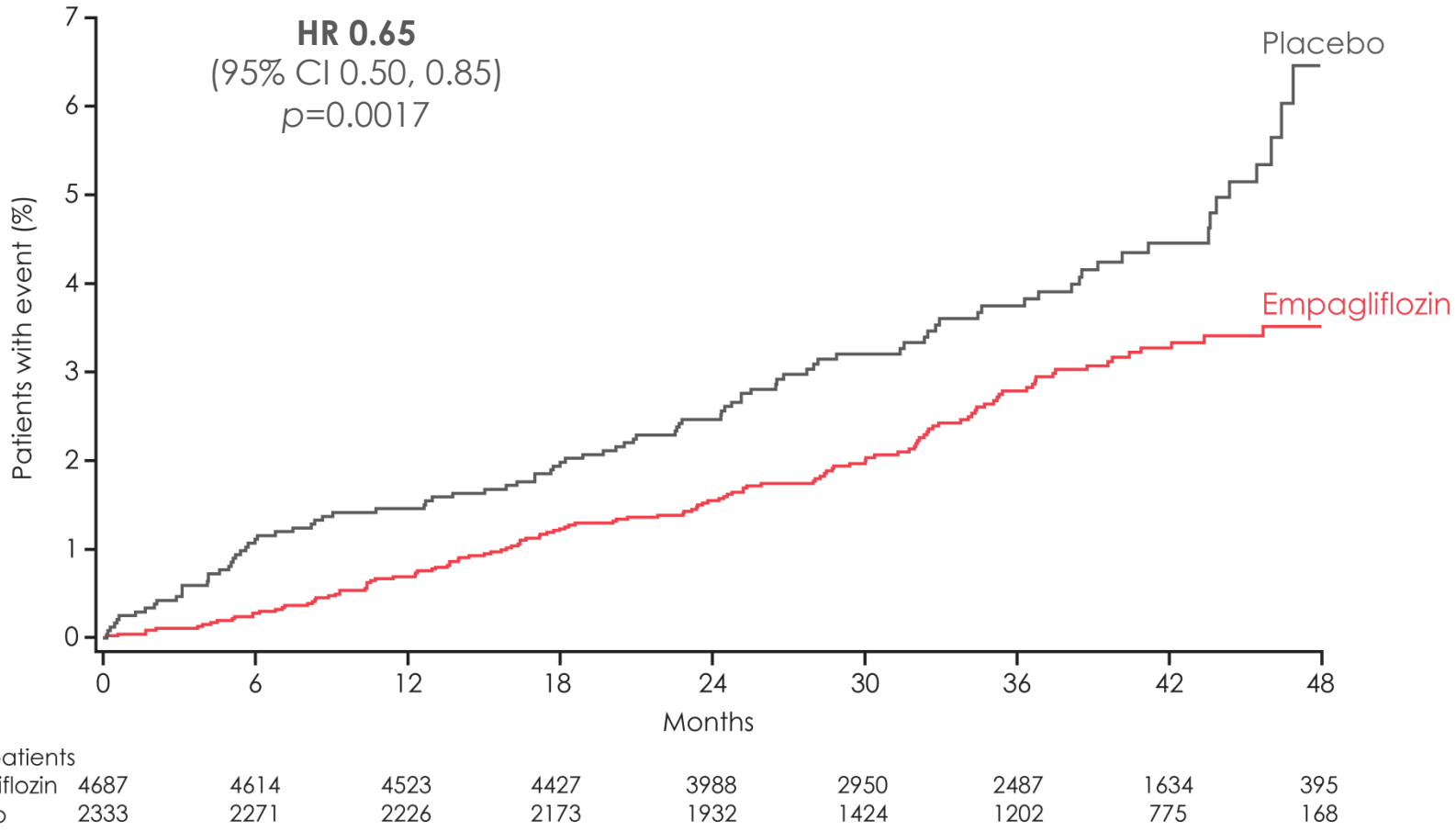
No. of patients									
Empagliflozin	4687	4580	4455	4328	3851	2821	2359	1534	370
Placebo	2333	2256	2194	2112	1875	1380	1161	741	166

CV death



No. of patients									
Empagliflozin	4687	4651	4608	4556	4128	3079	2617	1722	414
Placebo	2333	2303	2280	2243	2012	1503	1281	825	177

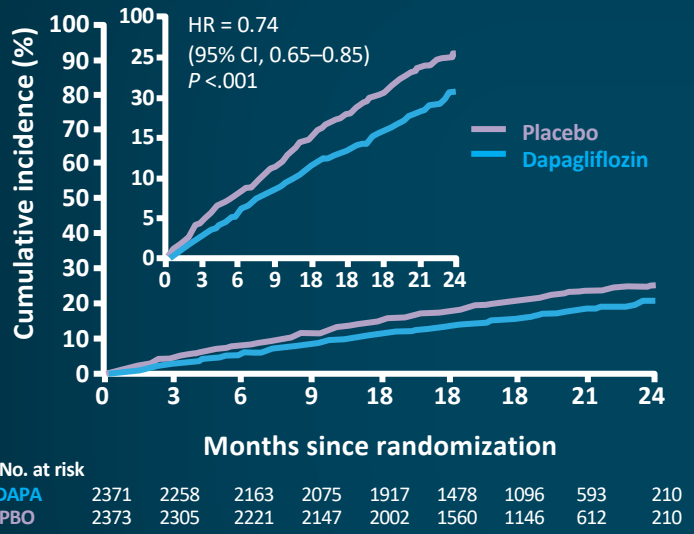
Hospitalisation for heart failure



Cumulative incidence function. HR, hazard

DAPA HF Primary Outcomes: DM vs Non-DM Subgroups

Primary outcome



Primary outcome subgroup analysis

Subgroup	DAPA n = 2373	PBO n = 2371	Hazard Ratio (95% CI)
	Patients/total, no.		
Hospitalization for heart failure			
Yes	195/1124	279/1127	0.67 (0.56–0.80)
No	191/1249	223/1244	0.84 (0.69–1.01)
Type 2 diabetes at baseline			
Yes	215/1075	271/1064	0.75 (0.63–0.90)
No	171/1298	231/1307	0.73 (0.60–0.88)
Afib or flutter on enrollment ECG			
Yes	109/569	126/559	0.82 (0.63–1.06)
No	277/1804	376/1812	0.72 (0.61–0.84)
Main cause of heart failure			
Ischemic	223/1316	289/1358	0.77 (0.65–0.92)
Non-ischemic or unknown	163/1057	213/1013	0.74 (0.58–0.97)
Body-mass index			
<30	259/1537	320/1533	0.78 (0.66–0.92)
≥30	127/834	182/838	0.69 (0.55–0.86)
Baseline eGFR (ml/min/1.73m²)			
<60	191/962	254/964	0.72 (0.59–0.86)
≥60	195/1410	248/1406	0.76 (0.63–0.92)

0.5 0.8 1.0 1.2
Favors dapagliflozin
Favors placebo

Primary outcome was composite of worse… *…on for HF or urgent visit resulting in IV treatment for HF*) or CV death, which …ntly lower (*P* <.001) percentage of patients in dapagliflo… …lacebo (21.2%).

DAPA = dapagliflozin; AFib = atrial fibrillation; ECG = electrocardiogram; IV = intravenous.

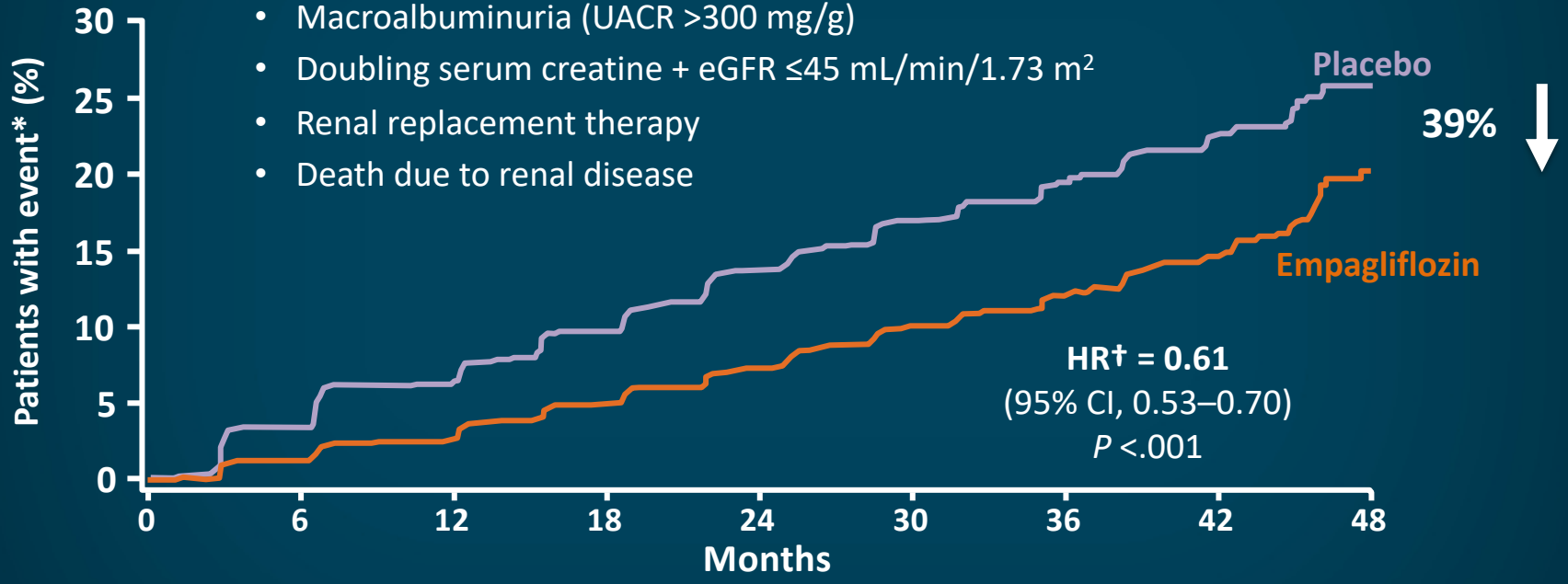
McMurray JJV, et al. *N Engl J Med.* 2019;381:1995-2008.

EMPA-REG OUTCOME: Secondary Outcome

Cumulative Incidence of Incident or Worsening Nephropathy

Incident or worsening nephropathy includes:

- Macroalbuminuria (UACR >300 mg/g)
- Doubling serum creatine + eGFR ≤45 mL/min/1.73 m^2
- Renal replacement therapy
- Death due to renal disease

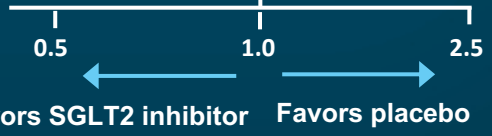


*Kaplan-Meier estimate; †Hazard ratio based on Cox regression analyses.

Wanner C, et al. *N Engl J Med*. 2016;375:323-334.

Meta-analysis of Effects of SGLT2 Inhibitors on Major Kidney Outcomes

Major kidney outcomes	Events	Patients	RR (95% CI)
Dialysis, transplantation, or death due to kidney disease	252	38,723	0.67 (0.52–0.86)
ESKD	335	38,723	0.65 (0.53–0.81)
Substantial loss of kidney function, ESKD, or death due to kidney disease	967	38,671	0.58 (0.51–0.66)
Substantial loss of kidney function, ESKD, or death due to CV or kidney disease	2323	38,676	0.71 (0.63–0.82)
Acute kidney injury	943	38,684	0.75 (0.66–0.85)



RR = relative risk.

Neuen BL, et al. *Lancet Diabetes Endocrinol*. 2019;7:845-854.

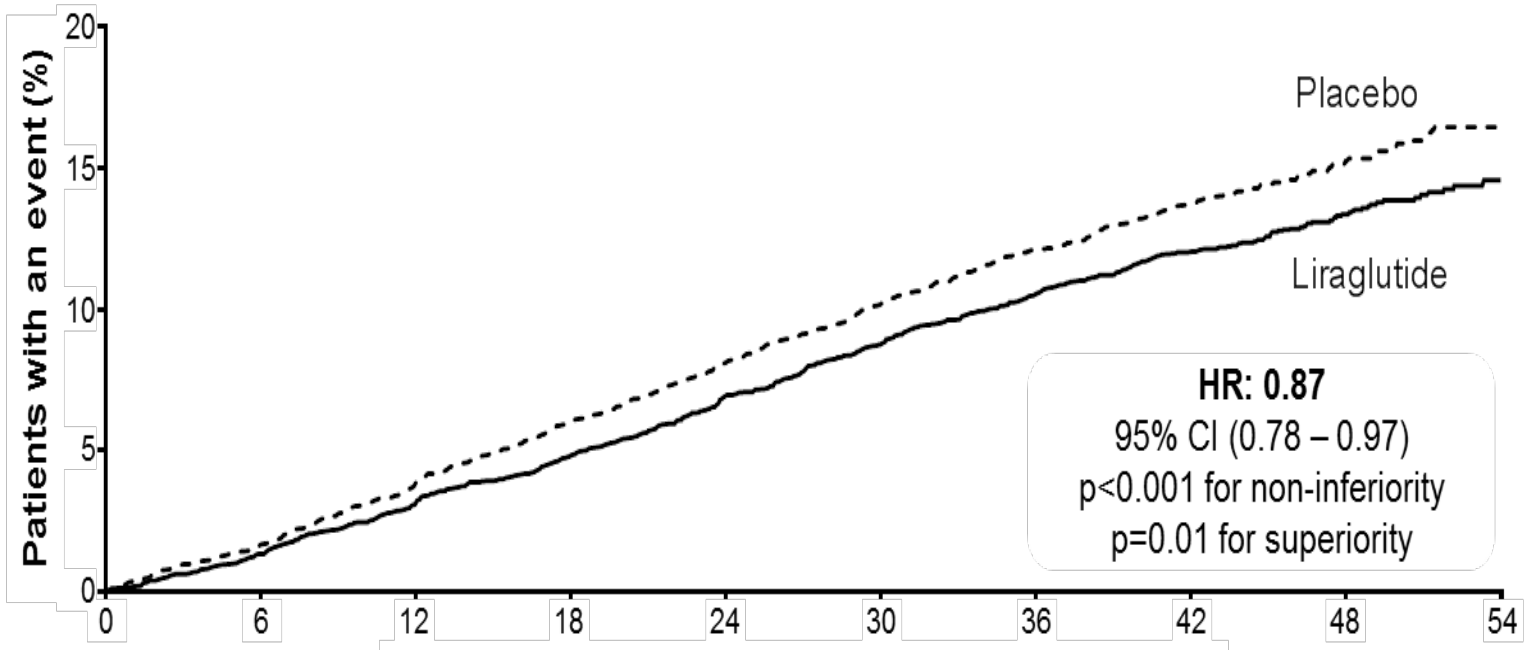
CV Outcomes Trials in Diabetes: GLP1-RA

Study	ELIXA	FREEDOM -CVO	LEADER	SUSTAIN 6	EXSCEL	REWIND
GLP1-RA	Lixi-senatide	ITCA-650 exenatide	liraglutide	semaglutide	Exenatide LR	dulaglutide
N	6,068	~4,000	9,340	3,297	14,752	9,901
Reported	2015	2016	2016	2016	2017	(2018)
CVOT Outcome	Neutral	Neutral	Benefit In label	Benefit	Neutral	Benefit
Other			Renal benefit	Worsening retinopathy		31% CVD; A1C = 7.3%

N Engl J Med 2016; 375:1834-1844, N Engl J Med 2016;375:311-322, Diab Obes Metab 2018;20:42-49, N Engl J Med 2017;377:1228-1239, NEJM 2015;373:2247-2257

Primary outcome

CV death, non-fatal myocardial infarction, or non-fatal stroke



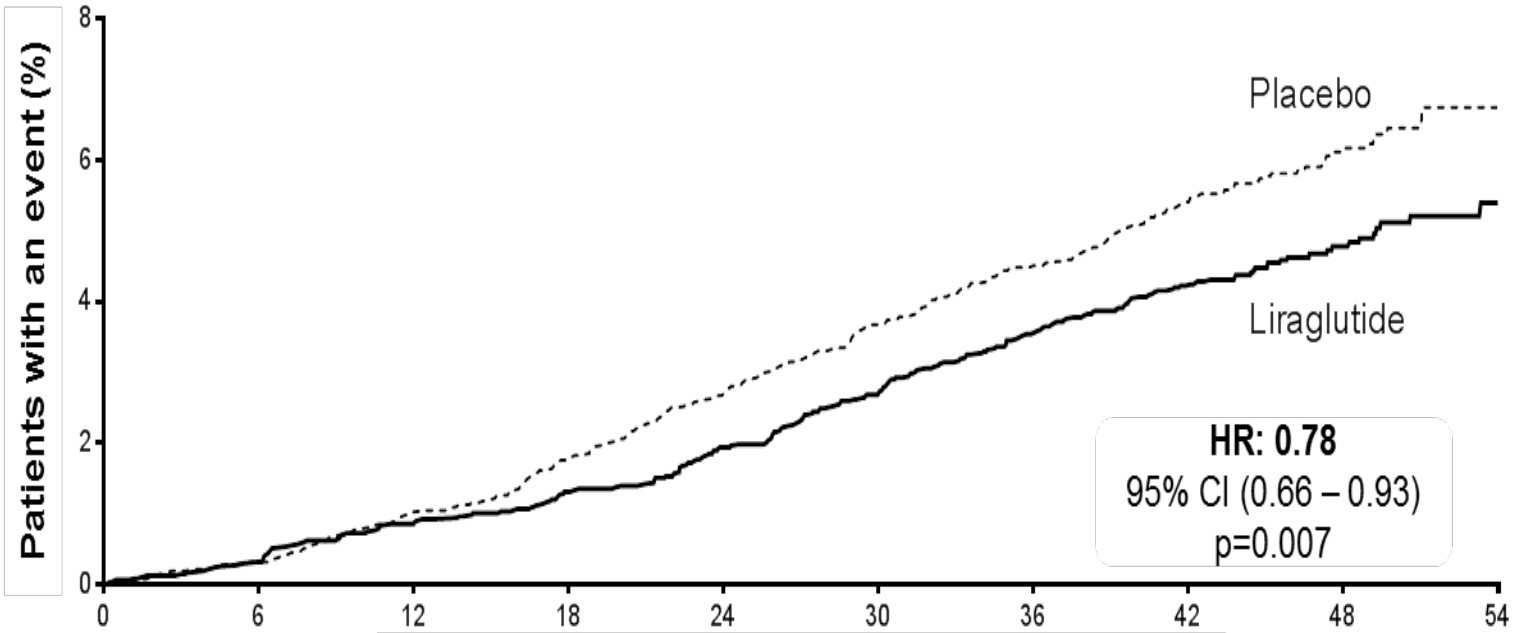
Patients at risk

Liraglutide	4668	4593	4496	4400	4280	4172	4072	3982	1562	424
Placebo	4672	4588	4473	4352	4237	4123	4010	3914	1543	407

The primary composite outcome in the time-to-event analysis was the first occurrence of death from cardiovascular causes, non-fatal myocardial infarction, or non-fatal stroke. The cumulative incidences were estimated with the use of the Kaplan–Meier method, and the hazard ratios with the use of the Cox proportional-hazard regression model. The data analyses are truncated at 54 months, because less than 10% of the patients had an observation time beyond 54 months. CI: confidence interval; CV: cardiovascular; HR: hazard ratio.

Presented at the American Diabetes Association 76th Scientific Sessions, Session 3-CT-SY24. June 13 2016, New Orleans, LA, USA.

CV death



Patients at risk										
Liraglutide	4668	4641	4599	4558	4505	4445	4382	4322	1723	484
Placebo	4672	4648	4601	4546	4479	4407	4338	4267	1709	465

The cumulative incidences were estimated with the use of the Kaplan–Meier method, and the hazard ratios with the use of the Cox proportional-hazard regression model. The data analyses are truncated at 54 months, because less than 10% of the patients had an observation time beyond 54 months.
CI: confidence interval; CV: cardiovascular; HR: hazard ratio.

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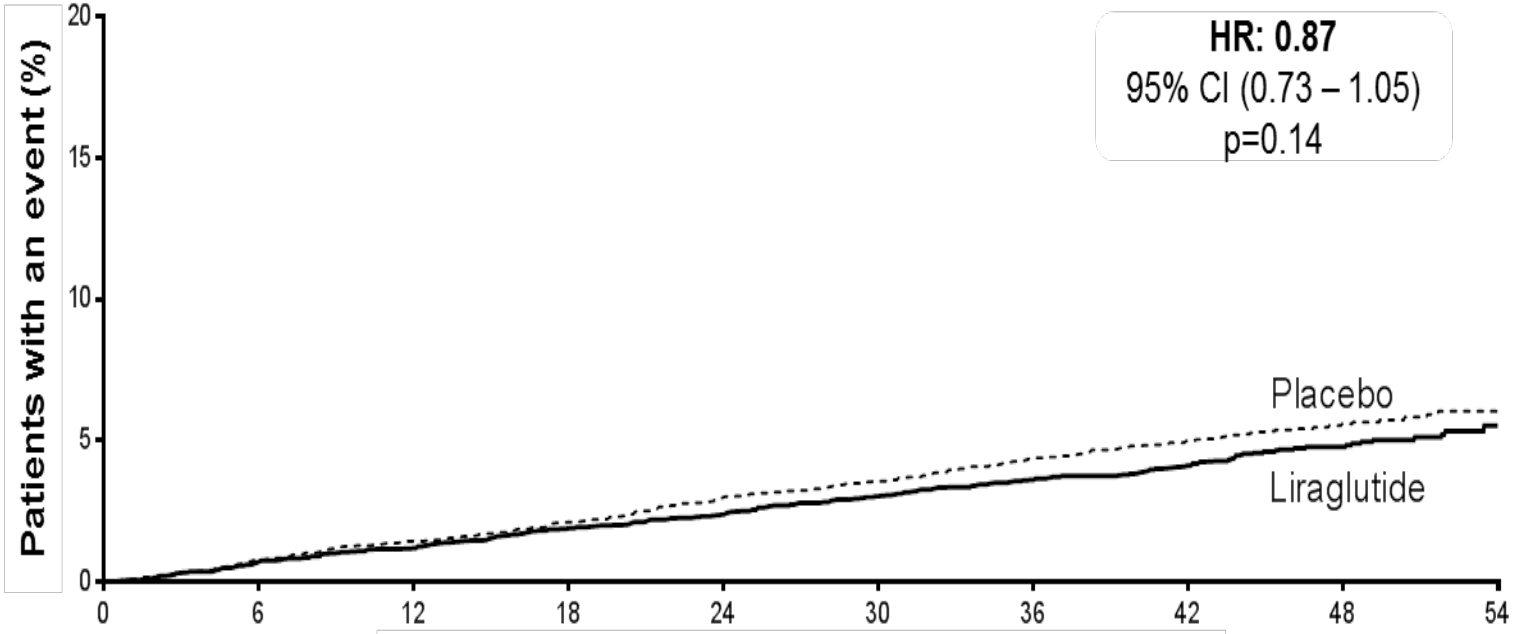
Hospitalization for heart failure



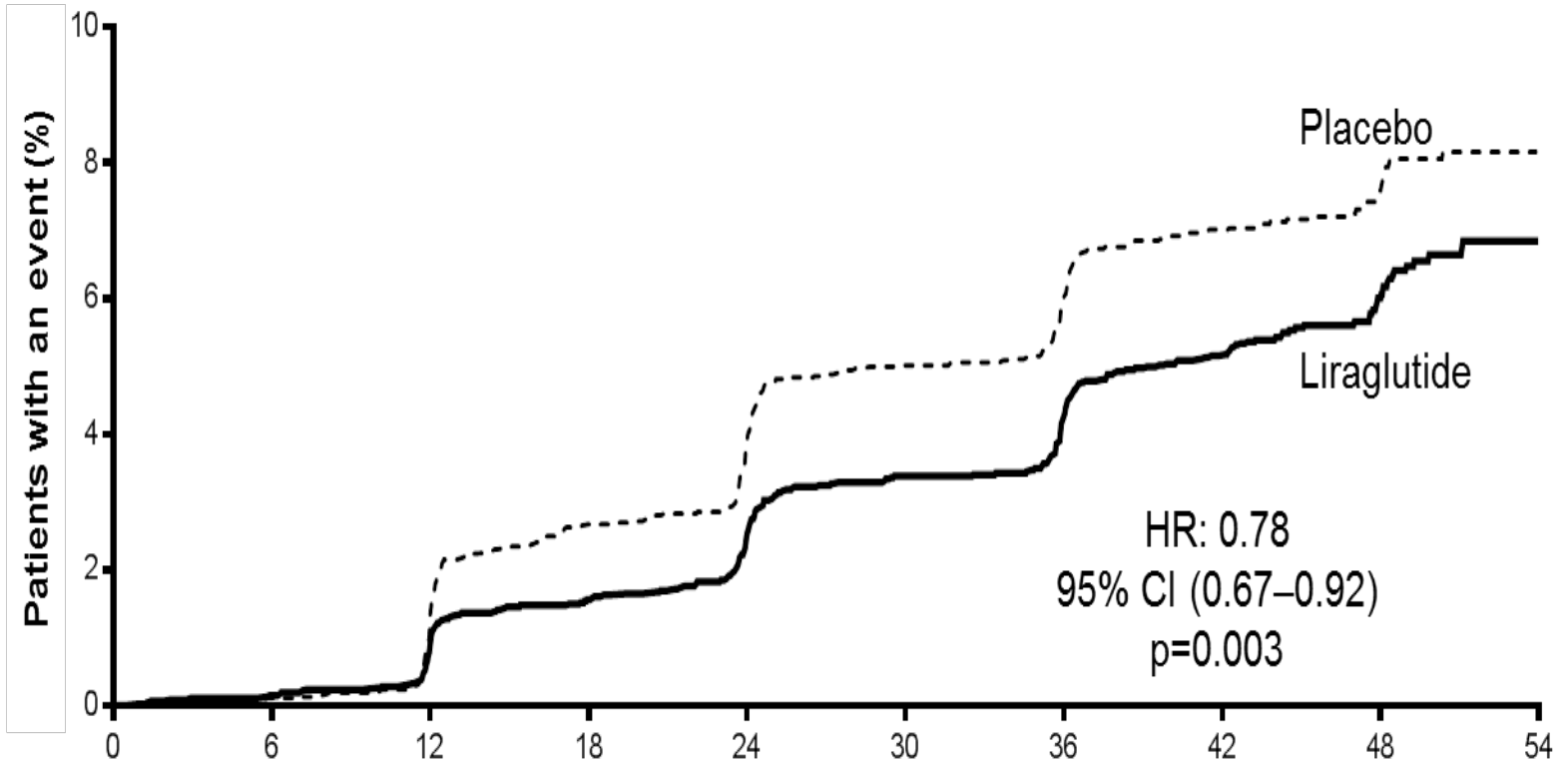
Patients at risk										
Liraglutide	4668	4612	4550	4483	4414	4337	4258	4185	1662	467
Placebo	4672	4612	4540	4464	4372	4288	4187	4107	1647	442

The cumulative incidences were estimated with the use of the Kaplan–Meier method, and the hazard ratios with the use of the Cox proportional-hazard regression model. The data analyses are truncated at 54 months, because less than 10% of the patients had an observation time beyond 54 months. CI: confidence interval; HR: hazard ratio.

Presented at the American Diabetes Association 76th Scientific Sessions, Session 3-CT-SY24. June 13 2016, New Orleans, LA, USA.

Time to first renal event

Macroalbuminuria, doubling of serum creatinine, ESRD, renal death



Patients at risk										
Liraglutide	4668	4635	4561	4492	4400	4304	4210	4114	1632	454
Placebo	4672	4643	4540	4428	4316	4196	4094	3990	1613	433

The cumulative incidences were estimated with the use of the Kaplan–Meier method, and the hazard ratios with the use of the Cox proportional-hazard regression model. The data analyses are truncated at 54 months, because less than 10% of the patients had an observation time beyond 54 months. CI: confidence interval; ESRD: end-stage renal disease; HR: hazard ratio.

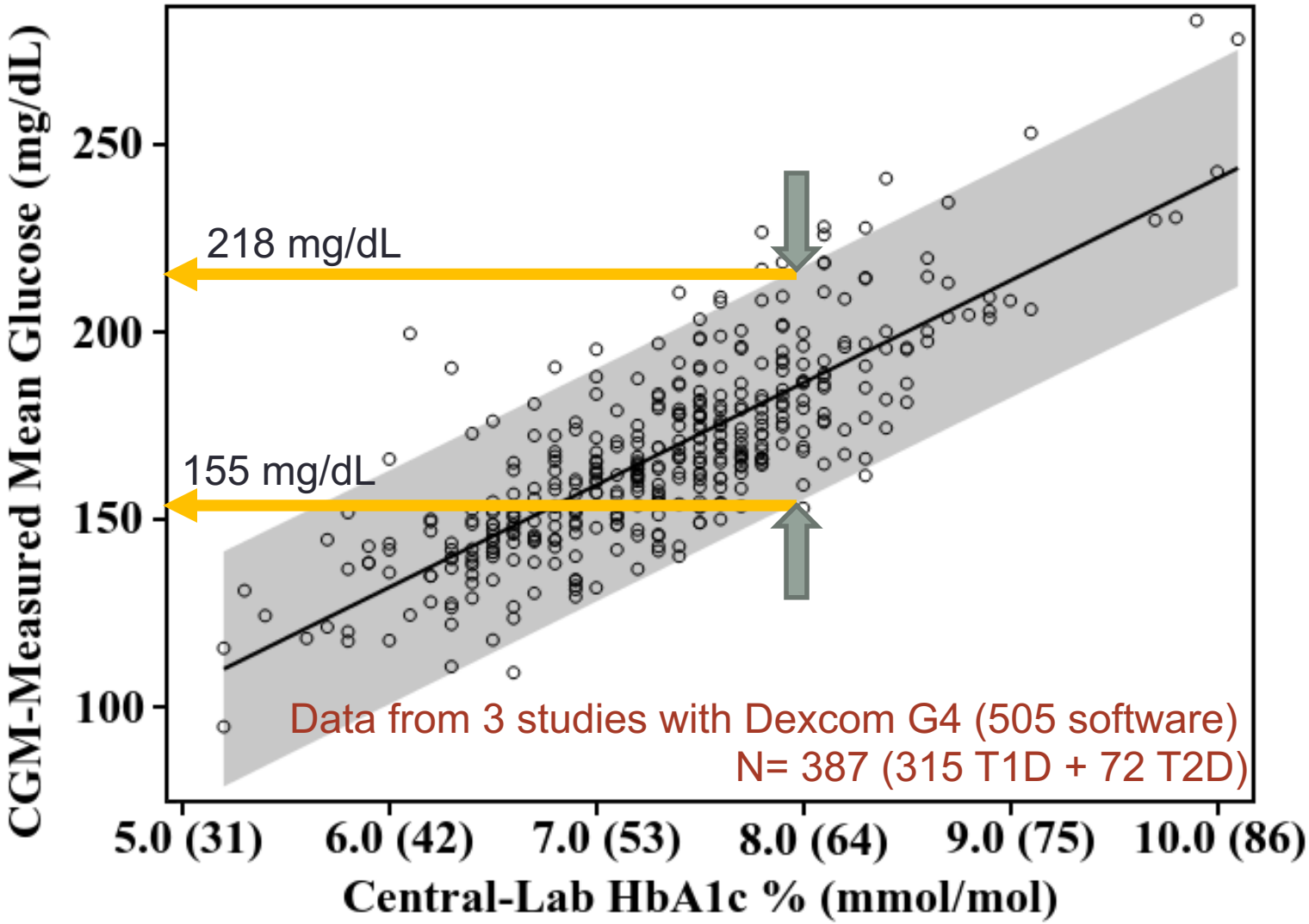
Presented at the American Diabetes Association 76th Scientific Sessions, Session 3-CT-SY24. June 13 2016, New Orleans, LA, USA.

Is A1c Enough To Help Us Manage Patients?

- **Strengths of A1c**
  - Reflects blood glucose concentrations over ~3 months
  - Only metric of glycemic control that has been prospectively associated with chronic complications
  - Useful for assessing trends in a population over time
- **Limitations of A1c**
  - Affected by other conditions that affect red blood cell lifespan or interfere with glucose binding to hemoglobin
  - A wide range of mean glucose concentrations exist for a given HbA1c level
  - Provides no information about hypoglycemia frequency or severity
  - May under-represent the burden of hyperglycemia in African-Americans

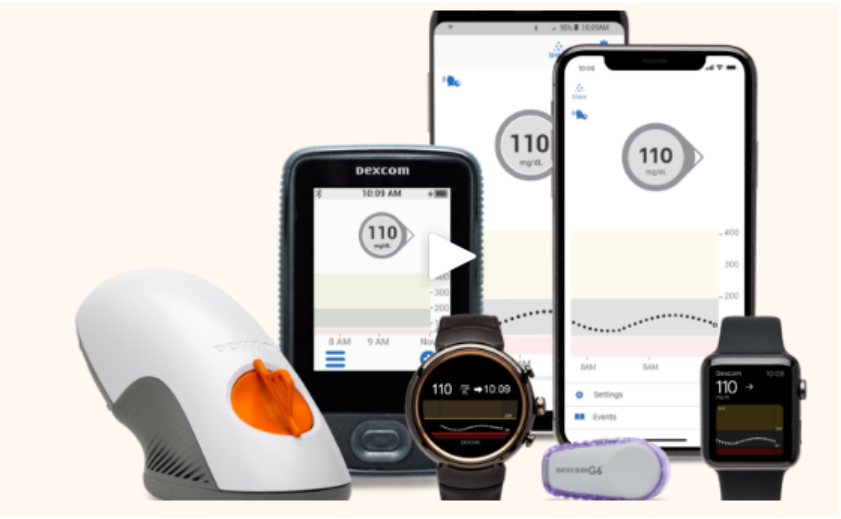
Beck RW, et al. Diabetes Care. 2017;40:994-999.

CGM-measured Mean Glucose Versus Lab-Measured HbA1c



Slide thanks to Roy Beck (Beck RW, et al. Diabetes Care. 2017;40:994-999.)

Dexcom G6 CGM System



- Factory calibrated
- Approved for nonadjunctive use (ie, don't need to use blood glucose meter)
- 10 days of sensor use
- Measures glucose concentration every 5min
- Has alarms for hypoglycemia and hyperglycemia thresholds and alerts for trending high or low
- Can display glucose levels on a receiver, phone, or watch
- Can 'share' glucose readings with someone else (e.g., parent, spouse)

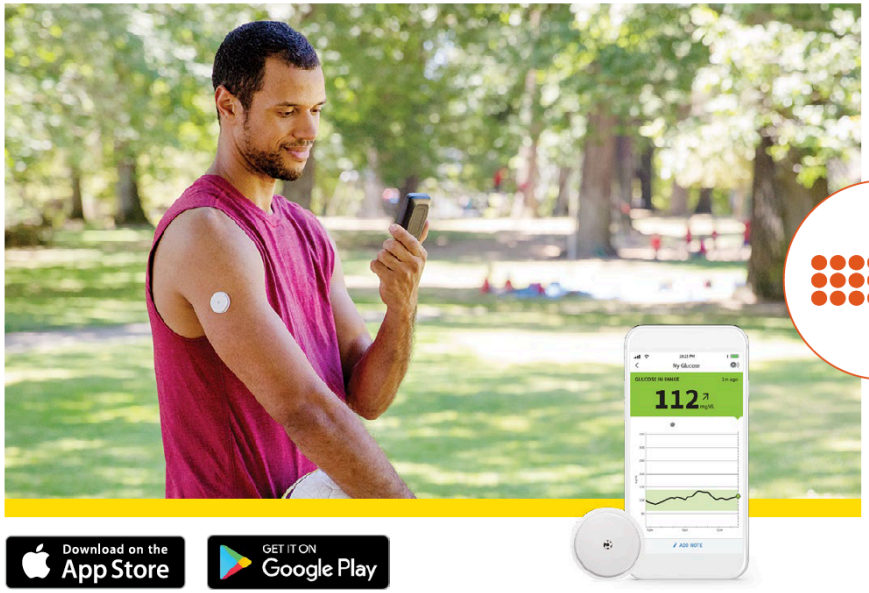
Freestyle Libre 1 and 2

- Libre 1 and Libre 2 available
- Must swipe both for reading
- Libre 1 works with reader and smart phone but less accurate in low range, no alarms
- Libre 2 much more accurate but works with reader alone. Has low and high alarm
- Both last for 14 days

Websites for Data Transfer: Libre

CONNECT TO YOUR DOCTOR'S OFFICE WITH:

FreeStyle LibreLink



Download on the App Store

GET IT ON Google Play

AND UPLOAD GLUCOSE DATA TO:

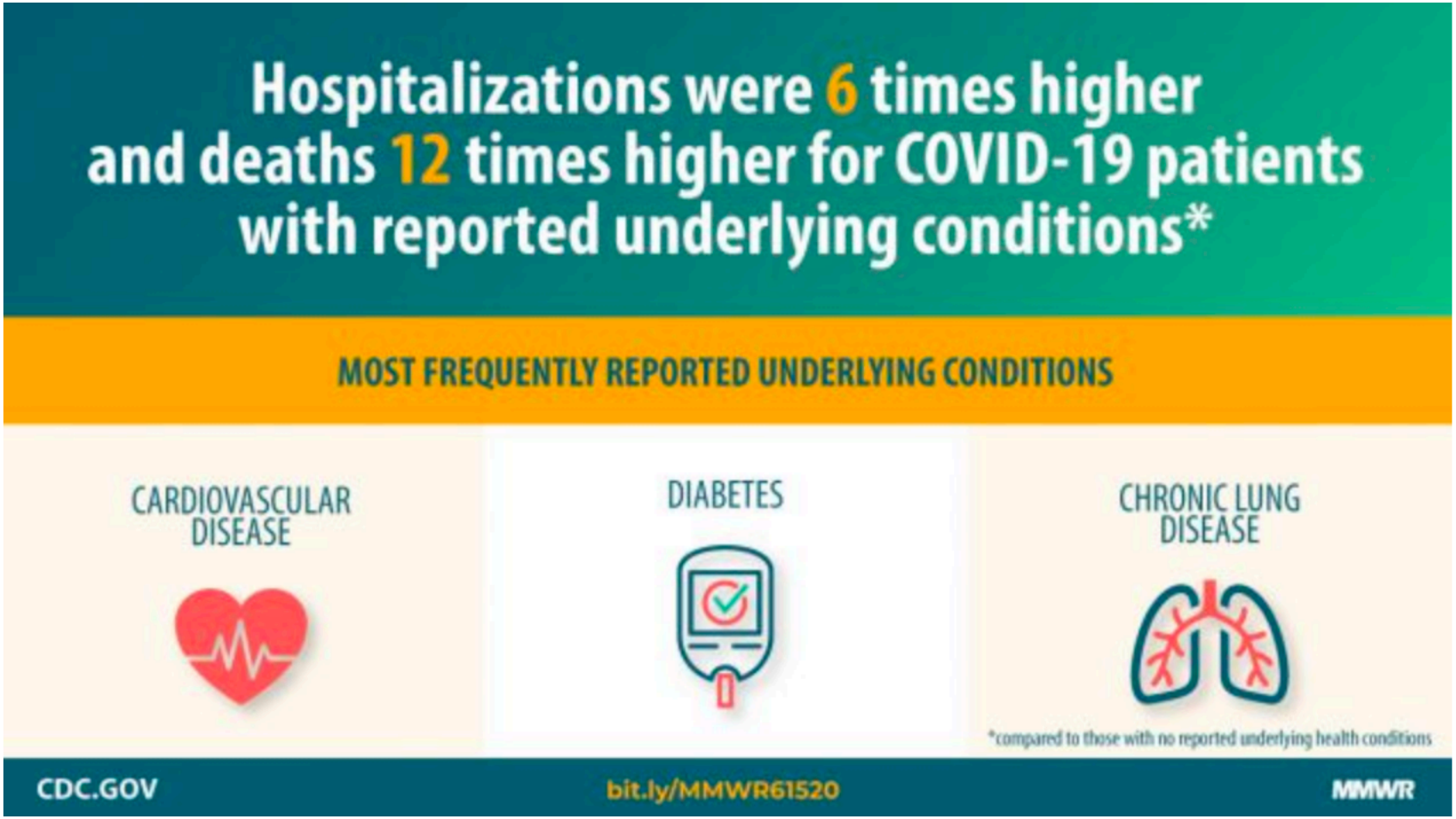
LibreView

With the FreeStyle LibreLink app,[‡,§,‖] the "Connect to a Practice" feature lets you easily:

- **CONNECT** to your doctor's LibreView[¶] account with a one-time, easy setup
- **SHARE** your glucose data automatically[#] with your doctor in real time

With the secure LibreView[¶] website, you and your doctor can:

- **VIEW AND SHARE** your glucose data in detailed reports
- **USE** the reports to guide informed treatment decisions



MMWR June 19, 2020. 69:759-765

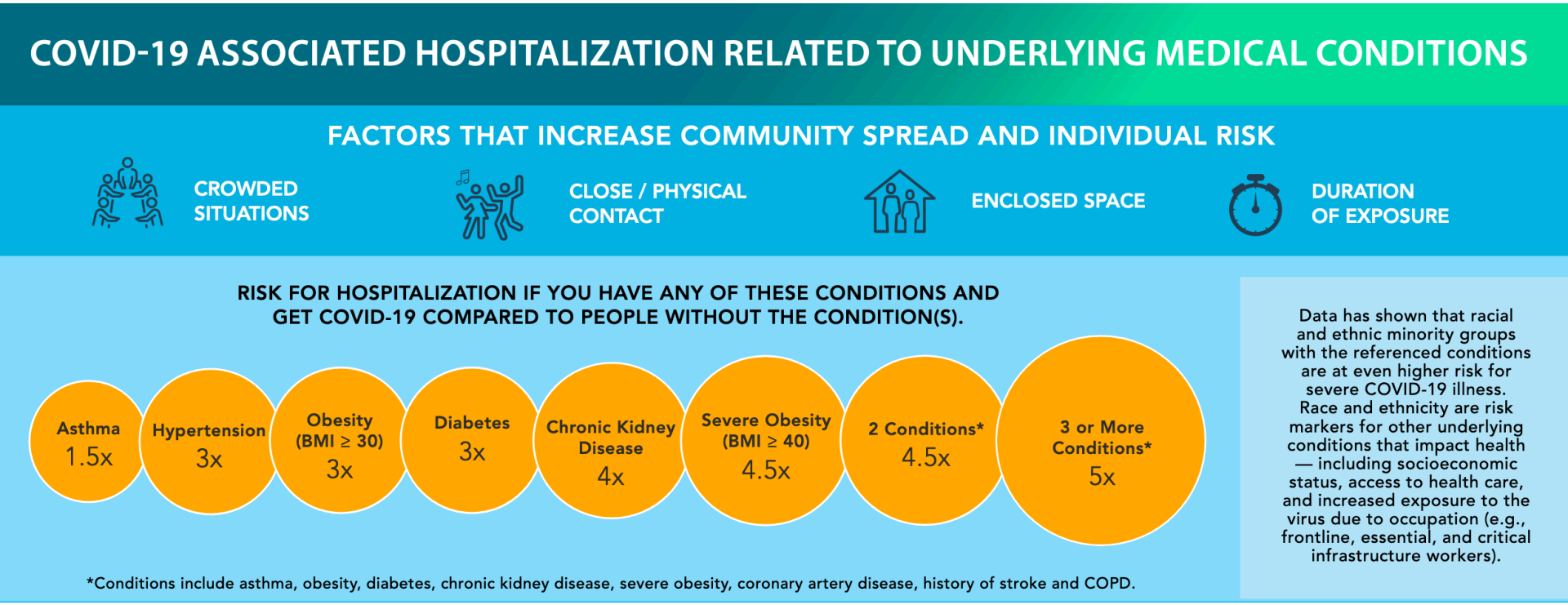
Current CDC List of Conditions that Cause an Increased Risk of Severe Illness from COVID-19

- Cancer
- CKD
- COPD
- Heart Conditions
- Immunocompromised state from a solid organ transplant
- Obesity—BMI of 30 – 40 kg/m^2
- Severe Obesity—BMI > 40 kg/m^2
- Sickle Cell Disease
- Smoking
- T2DM

Current CDC List of Conditions that Might Increase the Risk of Severe Illness from COVID-19

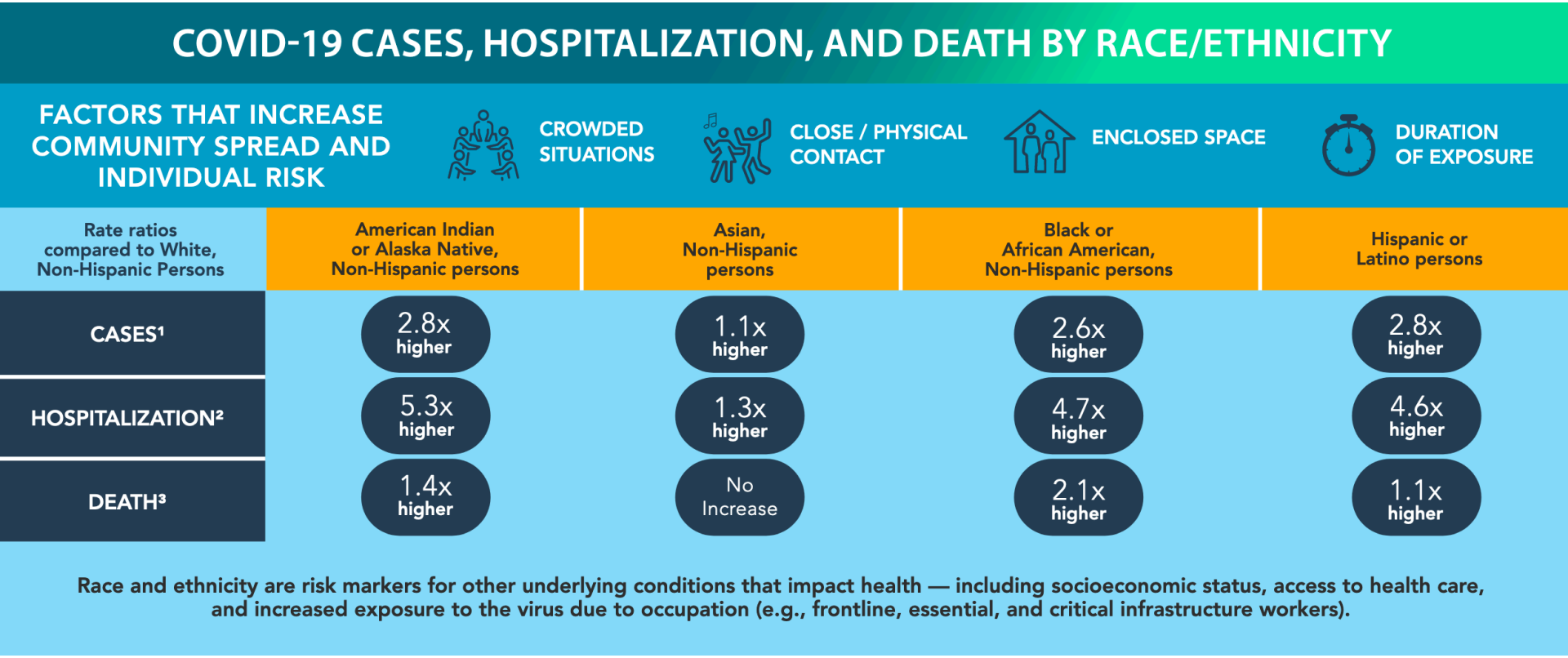
- Asthma (moderate to severe)
- Cerebrovascular disease
- Cystic fibrosis
- HTN
- Immunocompromised state (HIV/Steroids/bone marrow transplant/other meds/etc)
- Neurologic conditions such as dementia
- Liver disease
- Overweight BMI 25 – 30 kg/m^2
- Pregnancy
- Pulmonary fibrosis
- Thalessemia
- T1DM

CDC Risk for Hospitalization



https://www.cdc.gov/coronavirus/2019-ncov/downloads/covid-data/hospitalization-underlying-medical-conditions.pdf

CDC Impact of Ethnicity



https://www.cdc.gov/coronavirus/2019-ncov/downloads/covid-data/hospitalization-underlying-medical-conditions.pdf

Join "DHS_Guest"

Health Services
LOS ANGELES COUNTY

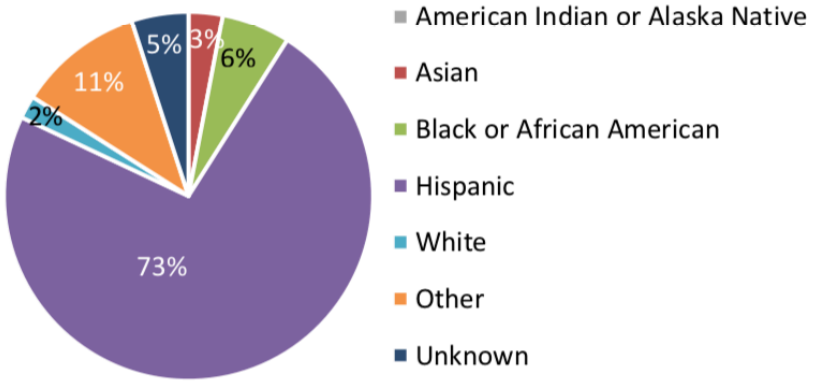
COVID-19 Dashboard

10/13/20

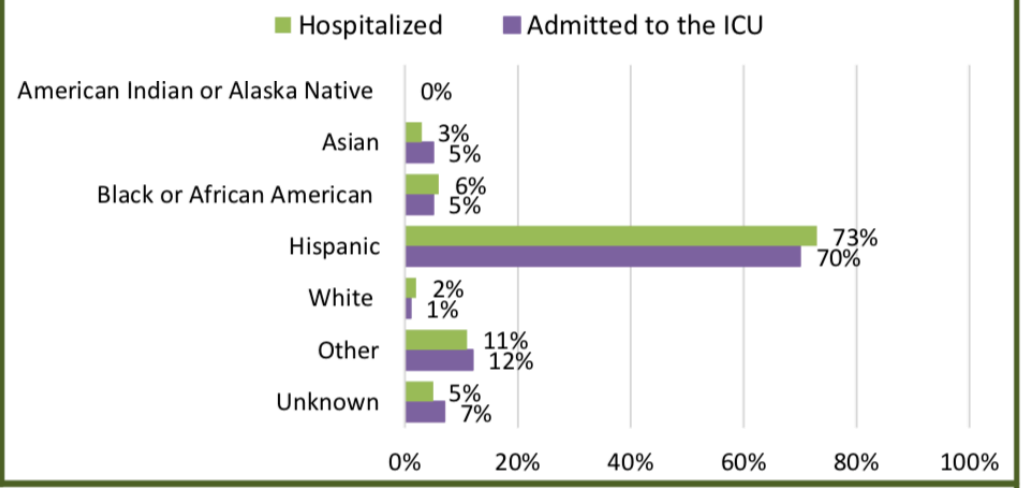
DHS COVID Demographics by Race/Ethnicity[1]

(March 1 – October 10, 2020)

COVID Cases Hospitalized by Race/Ethnicity (% of patients)



COVID Cases Hospitalized by Race/Ethnicity & ICU Admission (% of patients)

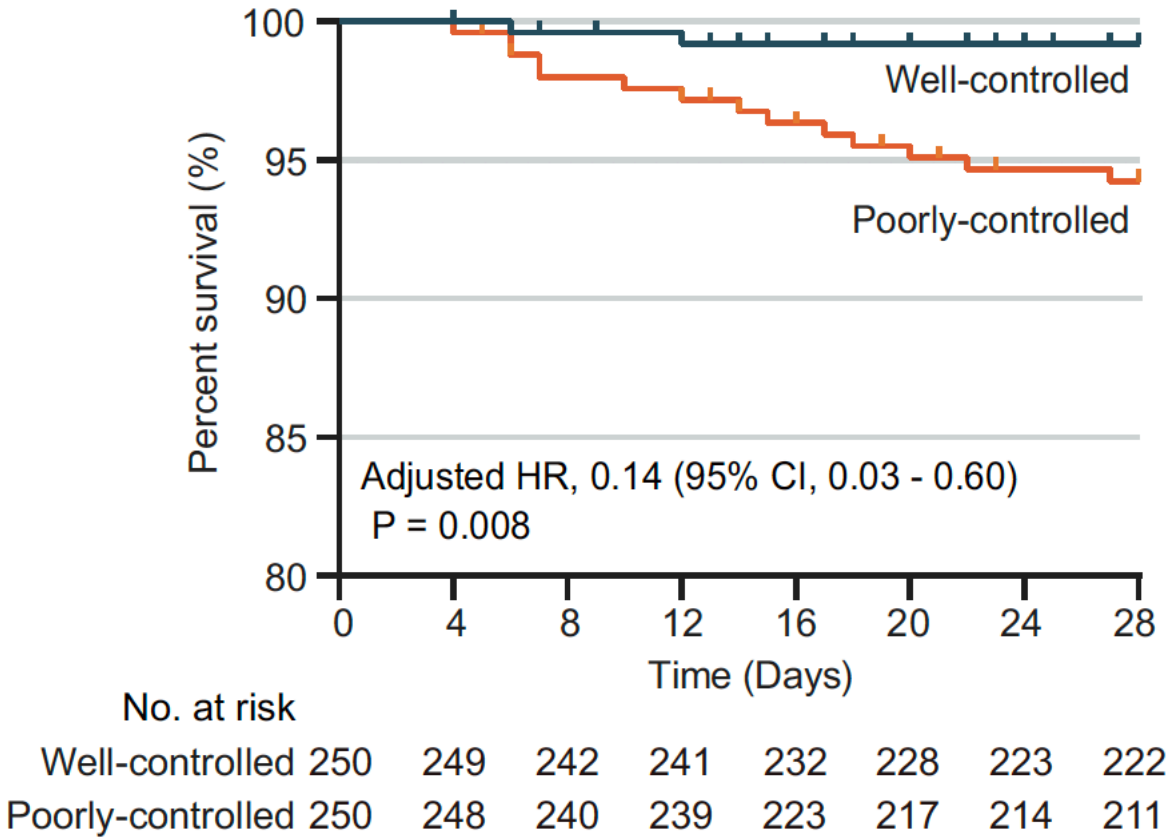


A1C and Risk of Death in China

- Patients in Hubei Province
- 6,385 without T2DM. (A1C = 6.1%)
- 952 with T2DM (A1C = 7.9%)
- 282 well-controlled (A1C = 7.3%) (3.9 – 10); 528 poorly controlled (A1C = 8.1%) (3.9 - >10).
- 250 well-controlled matched with 250 poorly controlled patients (1:1 propensity score-matched analysis)

Cell Metabolism 31:1068-1077, 2020

Survival Curves



Cell Metabolism 31:1068-1077, 2020

COVID Deaths Associated with DM in the UK

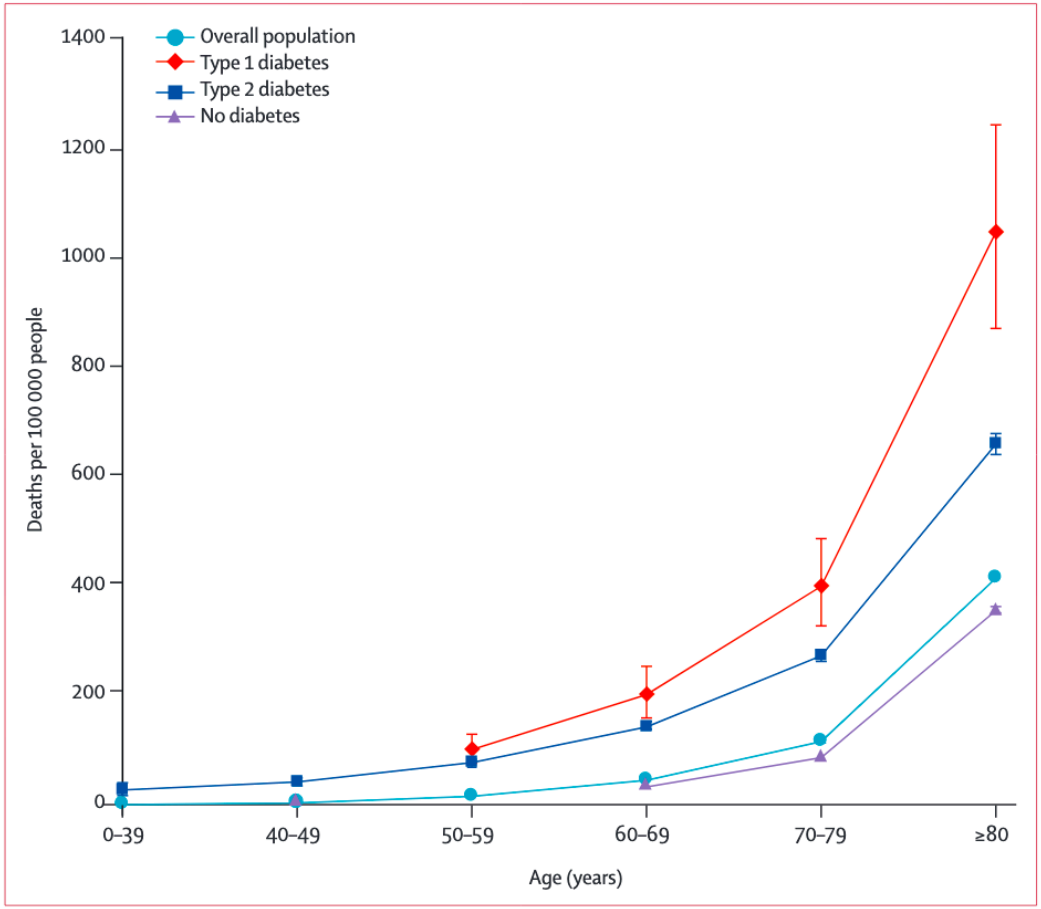
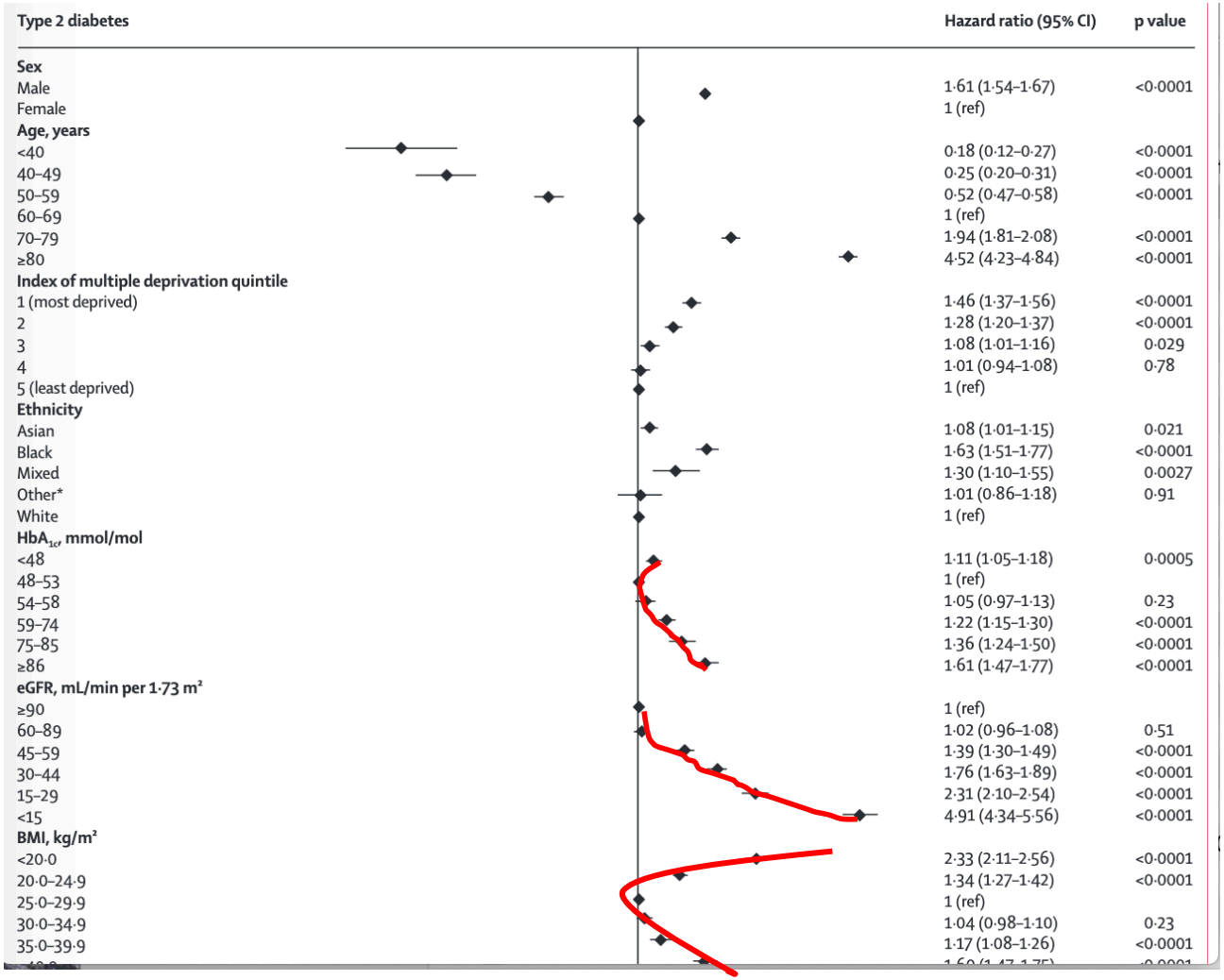


Figure 1: **Unadjusted in-hospital COVID-19 mortality rates, March 1 to May 11, 2020, by diabetes status**
Error bars show 95% CIs. Data for age groups 0–39 years and 40–49 years for type 1 diabetes and 0–39 years and 50–59 years for no diabetes have been excluded because of small numbers of events (one to four), to comply with data protection regulations.

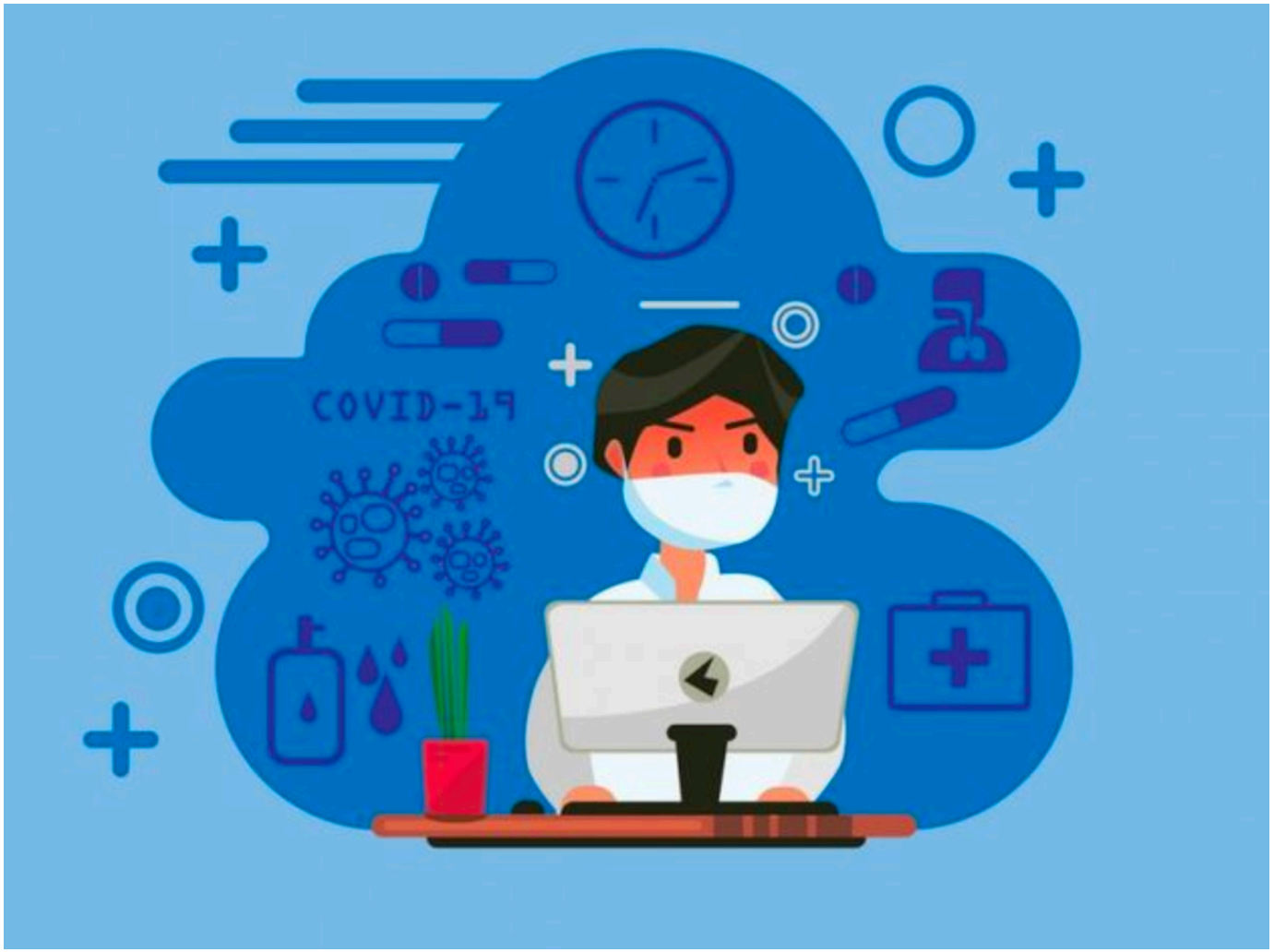
The Lancet August 2020 DOI:https://doi.org/10.1016/S2213-8587(20)30272-2

COVID Deaths in the UK—T2DM

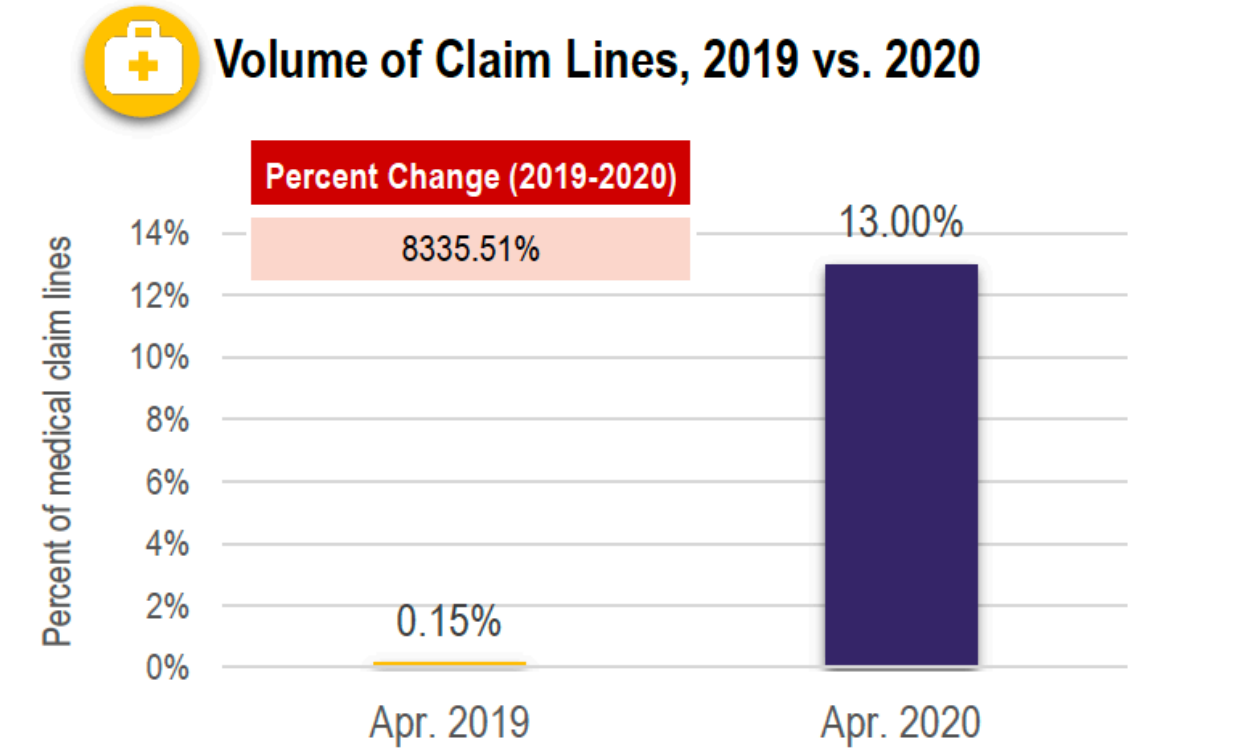


Type 2 diabetes	Hazard ratio (95% CI)	p value
Sex		
Male	1·61 (1·54–1·67)	<0·0001
Female	1 (ref)	
Age, years		
<40	0·18 (0·12–0·27)	<0·0001
40–49	0·25 (0·20–0·31)	<0·0001
50–59	0·52 (0·47–0·58)	<0·0001
60–69	1 (ref)	
70–79	1·94 (1·81–2·08)	<0·0001
≥80	4·52 (4·23–4·84)	<0·0001
Index of multiple deprivation quintile		
1 (most deprived)	1·46 (1·37–1·56)	<0·0001
2	1·28 (1·20–1·37)	<0·0001
3	1·08 (1·01–1·16)	0·029
4	1·01 (0·94–1·08)	0·78
5 (least deprived)	1 (ref)	
Ethnicity		
Asian	1·08 (1·01–1·15)	0·021
Black	1·63 (1·51–1·77)	<0·0001
Mixed	1·30 (1·10–1·55)	0·0027
Other*	1·01 (0·86–1·18)	0·91
White	1 (ref)	
HbA_{1c}, mmol/mol		
<48	1·11 (1·05–1·18)	0·0005
48–53	1 (ref)	
54–58	1·05 (0·97–1·13)	0·23
59–74	1·22 (1·15–1·30)	<0·0001
75–85	1·36 (1·24–1·50)	<0·0001
≥86	1·61 (1·47–1·77)	<0·0001
eGFR, mL/min per 1·73 m^2		
≥90	1 (ref)	
60–89	1·02 (0·96–1·08)	0·51
45–59	1·39 (1·30–1·49)	<0·0001
30–44	1·76 (1·63–1·89)	<0·0001
15–29	2·31 (2·10–2·54)	<0·0001
<15	4·91 (4·34–5·56)	<0·0001
BMI, kg/m^2		
<20·0	2·33 (2·11–2·56)	<0·0001
20·0–24·9	1·34 (1·27–1·42)	<0·0001
25·0–29·9	1 (ref)	
30·0–34·9	1·04 (0·98–1·10)	0·23
35·0–39·9	1·17 (1·08–1·26)	<0·0001

March 2020: A New Era in Medicine



Monthly Telehealth Tracker



https://www.fairhealth.org/states-by-the-numbers/telehealth

CHECKLIST FOR SETTING UP A VIRTUAL CLINIC

J Med Internet Res. 2020 Aug; 22(8): e21609.

HOW TO CONDUCT A VIRTUAL CLINIC: A HEALTH CARE PROFESSIONAL'S GUIDE

STEP 1-BEFORE

- Review the electronic medical records
- Review blood test results
- Review patient notes
- Review last clinic consultation
- Review action points from the last consultation-have they been actioned?
- Review medication changes
- Establish reason(s) for the consultation

STEP 2-IMMEDIATELY BEFORE: SET-UP THE ENVIRONMENT AND TECHNOLOGY

- Identify a suitable location for the video consultation
- How many rooms are available and what technology is available in those rooms?
- Are the patient's notes available?
- Set-up your virtual clinic system
- Set-up the webcam and audio headset
- Login to the electronic health records
- What type of clinic is it, how many patients are there, and how many health care professionals participating in the clinic?
- Is there an MDT present or available if needed?
- What has been communicated to the patient- what time is their appointment and are you running on time?

STEP 3-DURING

- The following recommendations for how to undertake the virtual clinic consultations are adapted from best practice models for consultation models in primary care, including the Cambridge Calgary model and Neighbour models (Denness 2013).
- Introduce yourself
- Check patient details-DOB and name
- Check the signal and connection
- Establish informed consent to proceed with virtual consultation: implied, verbal or informed consent
- Build rapport throughout
- Clarify reason for the consultation from the HCP and patient perspectives
- Gather information
- Establish patient's ideas, concerns, and expectations, and understand this in light of the biopsychosocial context
- Respond to cues
- COVID-19 screening questions and consider direction to acute services if necessary
- Health promotion and health education
- Identify the key issues and problems
- Formulate a management plan with the patient
- Make use of resources available, eg, patient information leaflets and resources
- Explain how further investigations will be arranged
- Explain everything in a way the patient can understand
- Summarize as you go along and check understanding
- Outline when the next clinic appointment will be
- Final checklist of questions-quick checks about contact numbers, prescriptions, ketone meter
- Have the patients details changed?
- Safety netting (advise given to patient, to prevent further complications if their condition fails to improve)

STEP 4-AFTER

- Reflect on the consultation and housekeeping-prepare for the next virtual consultation
- Action outputs, for example, blood tests and forms, request imaging, writing prescriptions, and ensuring these get to the patient or right professional.
- Dictate the clinic letter
- Chase results of investigations

J Med Internet Res. 2020 Aug; 22(8): e21609.

FDA NEWS RELEASE

Coronavirus (COVID-19) Update: FDA allows expanded use of devices to monitor patients' vital signs remotely

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For Immediate Release: March 20, 2020

Continuous Glucose Monitors and Automated Insulin Dosing Systems in the Hospital Consensus Guideline

Original Article

Continuous Glucose Monitors and Automated Insulin Dosing Systems in the Hospital Consensus Guideline

Journal of Diabetes Science and Technology
1–30
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This article is the work product of the Continuous Glucose Monitor and Automated Insulin Dosing Systems in the Hospital Consensus Guideline Panel, which was organized by Diabetes Technology Society and met virtually on April 23, 2020. The guideline panel consisted of 24 international experts in the use of continuous glucose monitors (CGMs) and automated insulin dosing (AID) systems representing adult endocrinology, pediatric endocrinology, obstetrics and gynecology, advanced practice nursing, diabetes care and education, clinical chemistry, bioengineering, and product liability law. The panelists reviewed the medical literature pertaining to five topics: (1) continuation of home CGMs after hospitalization, (2) initiation of CGMs in the hospital, (3) continuation of AID systems in the hospital, (4) logistics and hands-on care of hospitalized patients using CGMs and AID systems, and (5) data management of CGMs and AID systems in the hospital. The panelists then developed three types of recommendations for each topic, including

Early Real-World Logistics of Inpatient CGM

Placement of sensor

- Skilled endocrine NP
- Proning trend → arm placement

Placement of receiver

- On door facing out, within 20 feet
- Re-used receiver (after cleaning)

Alerts (100 mg/dL to 250 mg/dL, drop/rise)

Slide courtesy of Dr. Shivani Agarwal

Outpatient Diabetes “ICU”

- New onset or out of control/sick patients
- Use CGM/InPen as much as possible
- Followed daily by my diabetes team
- Feedback provided/adjustments made via telemedicine/email
- Once stable patients go back to routine follow-up

87 year old on oral agents

Enayatollah Golshani
DOB: 10/07/1935
MRN: _____
DEVICE: FreeStyle LibreLink

USC Westside Center for Diabetes
PHONE: 310-272-8222
PAGE: 1 / 1
GENERATED: 10/18/2020

AGP Report

October 5, 2020 - October 18, 2020 (14 Days)

LibreView

GLUCOSE STATISTICS AND TARGETS

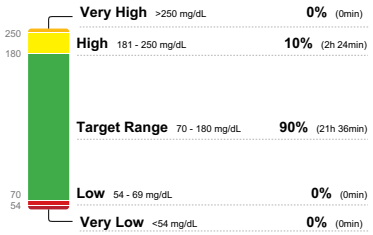
October 5, 2020 - October 18, 2020	**14 Days**
% Time CGM is Active	**77%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges Target Range 70-180 mg/dL	**Targets** % of Readings (Time/Day) Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)
Each 5% increase in time in range (70-180 mg/dL) is clinically beneficial.	

Average Glucose	**140** mg/dL
Glucose Management Indicator (GMI)	**6.7%**
Glucose Variability	**20.9%**

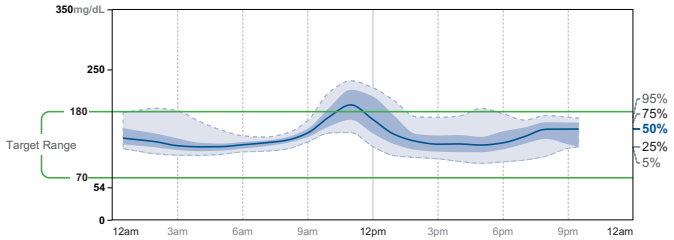
Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES



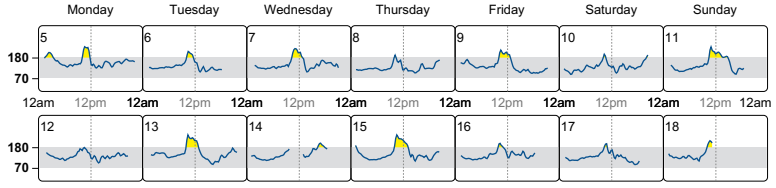
AMBULATORY GLUCOSE PROFILE (AGP)

AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if occurring in a single day.



DAILY GLUCOSE PROFILES

Each daily profile represents a midnight to midnight period with the date displayed in the upper left corner.



Source: Battelino, Tadej, et al. "Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range." Diabetes Care, American Diabetes Association, 7 June 2019, https://doi.org/10.2337/dci19-0028.

Reaction to COVID

David Hayden
DOB: 10/29/1938
MRN: _____
DEVICE: FreeStyle LibreLink

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PHONE: 310-272-8222
PAGE: 1 / 1
GENERATED: 10/18/2020

AGP Report

October 5, 2020 - October 18, 2020 (14 Days)

LibreView

GLUCOSE STATISTICS AND TARGETS

October 5, 2020 - October 18, 2020	**14 Days**
% Time CGM is Active	**60%**

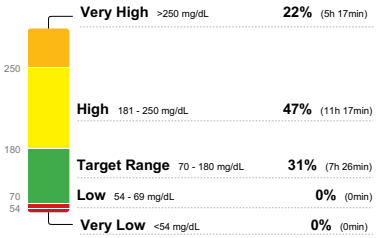
Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges	**Targets** % of Readings (Time/Day)
Target Range 70-180 mg/dL	Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)

Each 5% increase in time in range (70-180 mg/dL) is clinically beneficial.

Average Glucose	**214** mg/dL
Glucose Management Indicator (GMI)	**8.4%**
Glucose Variability	**21.2%**

Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES



AMBULATORY GLUCOSE PROFILE (AGP)

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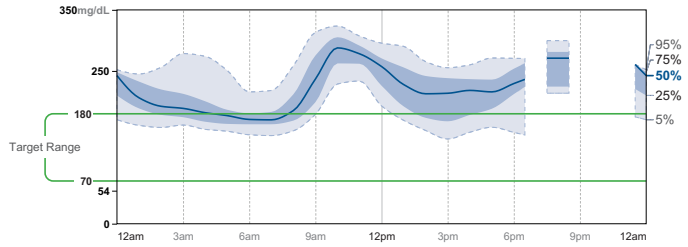

DAILY GLUCOSE PROFILES

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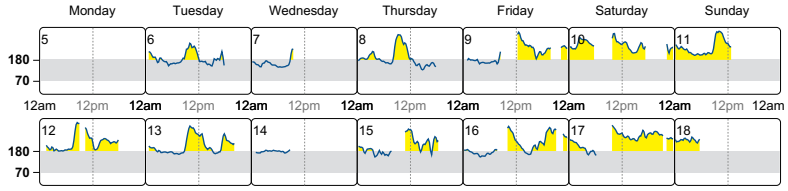
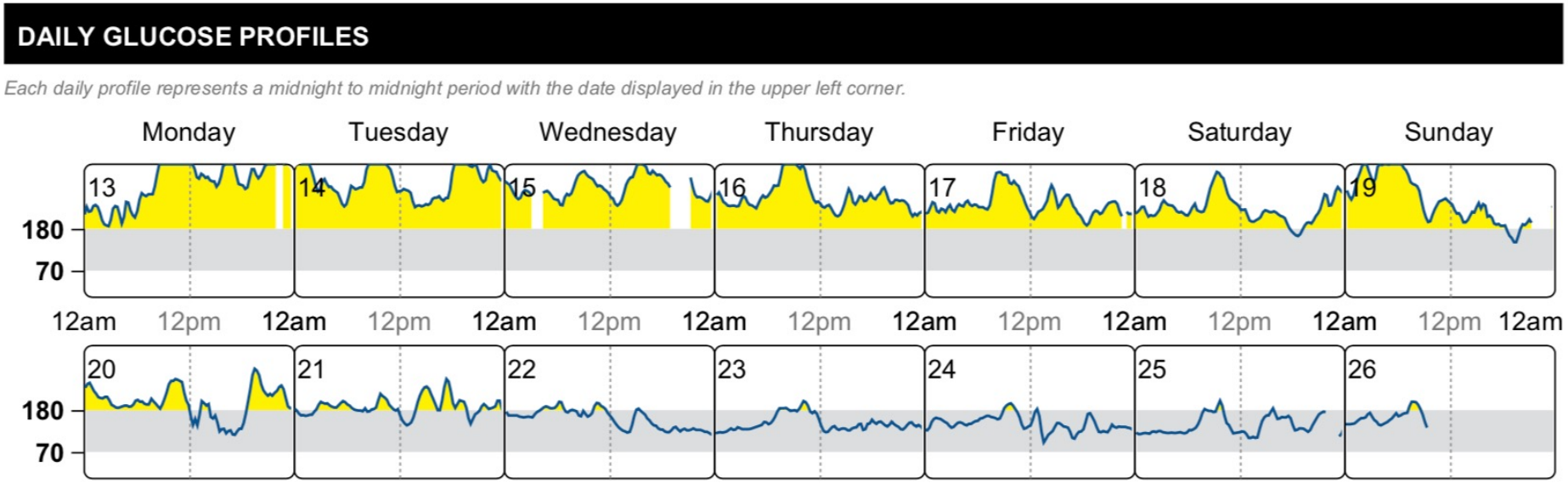


Source: Battelino, Tadej, et al. "Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range." Diabetes Care, American Diabetes Association, 7 June 2019, https://doi.org/10.2337/dci19-0028.

New Onset Diabetes with COVID-19



First Two Weeks

AGP Report

July 8, 2020 - July 21, 2020 (14 Days)

LibreView

GLUCOSE STATISTICS AND TARGETS

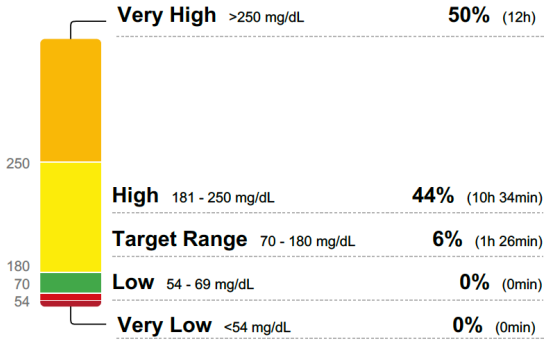
July 8, 2020 - July 21, 2020	**14 Days**
% Time CGM is Active	**60%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges Target Range 70-180 mg/dL	**Targets** % of Readings (Time/Day) Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)
Each 5% increase in time in range (70-180 mg/dL) is clinically beneficial.	

Average Glucose	**261** mg/dL
Glucose Management Indicator (GMI)	**9.6%**
Glucose Variability	**23.6%**

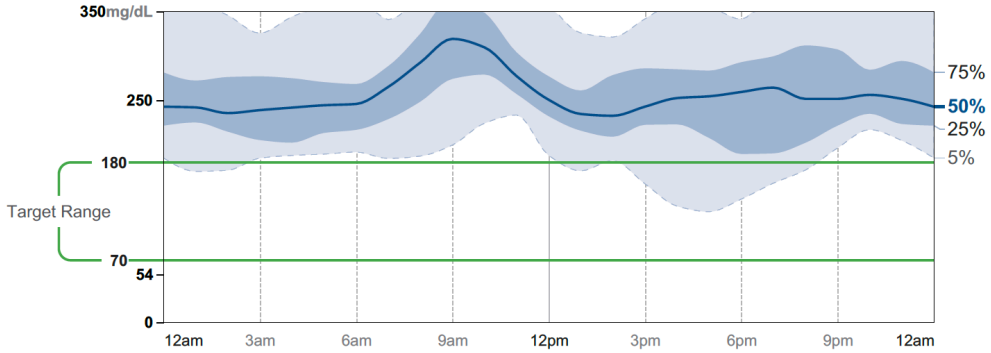
Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES



AMBULATORY GLUCOSE PROFILE (AGP)

AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if occurring in a single day.



4 – 6 Weeks Later

AGP Report

August 1, 2020 - August 14, 2020 (14 Days)

LibreView

GLUCOSE STATISTICS AND TARGETS

August 1, 2020 - August 14, 2020	**14 Days**
% Time CGM is Active	**70%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges Target Range 70-180 mg/dL	**Targets** % of Readings (Time/Day) Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)
Each 5% increase in time in range (70-180 mg/dL) is clinically beneficial.	

Average Glucose	**105** mg/dL
Glucose Management Indicator (GMI)	**5.8%**
Glucose Variability	**16.1%**

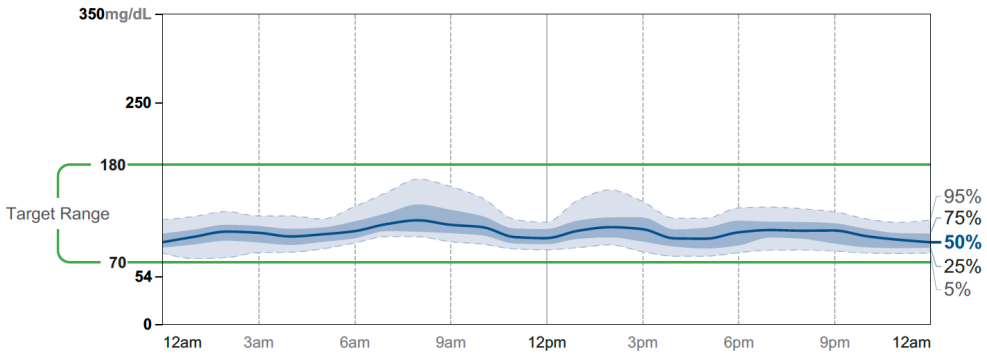
Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES

Very High >250 mg/dL	**0%**	(0min)
High 181 - 250 mg/dL	**0%**	(0min)
Target Range 70 - 180 mg/dL	**100%**	(24h)
Low 54 - 69 mg/dL	**0%**	(0min)
Very Low <54 mg/dL	**0%**	(0min)

AMBULATORY GLUCOSE PROFILE (AGP)

AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if occurring in a single day.



New Onset T1D

GLUCOSE STATISTICS AND TARGETS

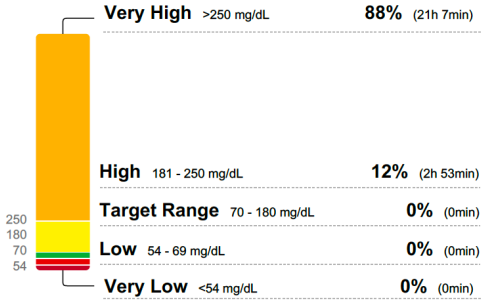
August 10, 2020 - August 16, 2020	**7 Days**
% Time CGM is Active	**60%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges Target Range 70-180 mg/dL	**Targets** % of Readings (Time/Day) Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)
Each 5% increase in time in range (70-180 mg/dL) is clinically beneficial.	

Average Glucose	**315** mg/dL
Glucose Management Indicator (GMI)	**-**
Glucose Variability	**17.5%**

Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES



AMBULATORY GLUCOSE PROFILE (AGP)

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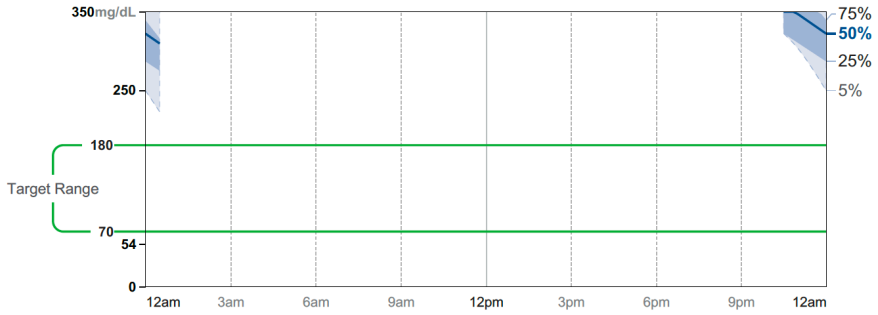

DAILY GLUCOSE PROFILES

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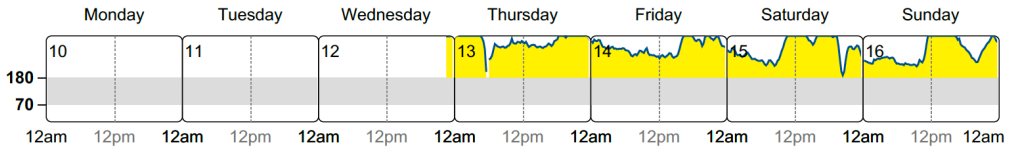
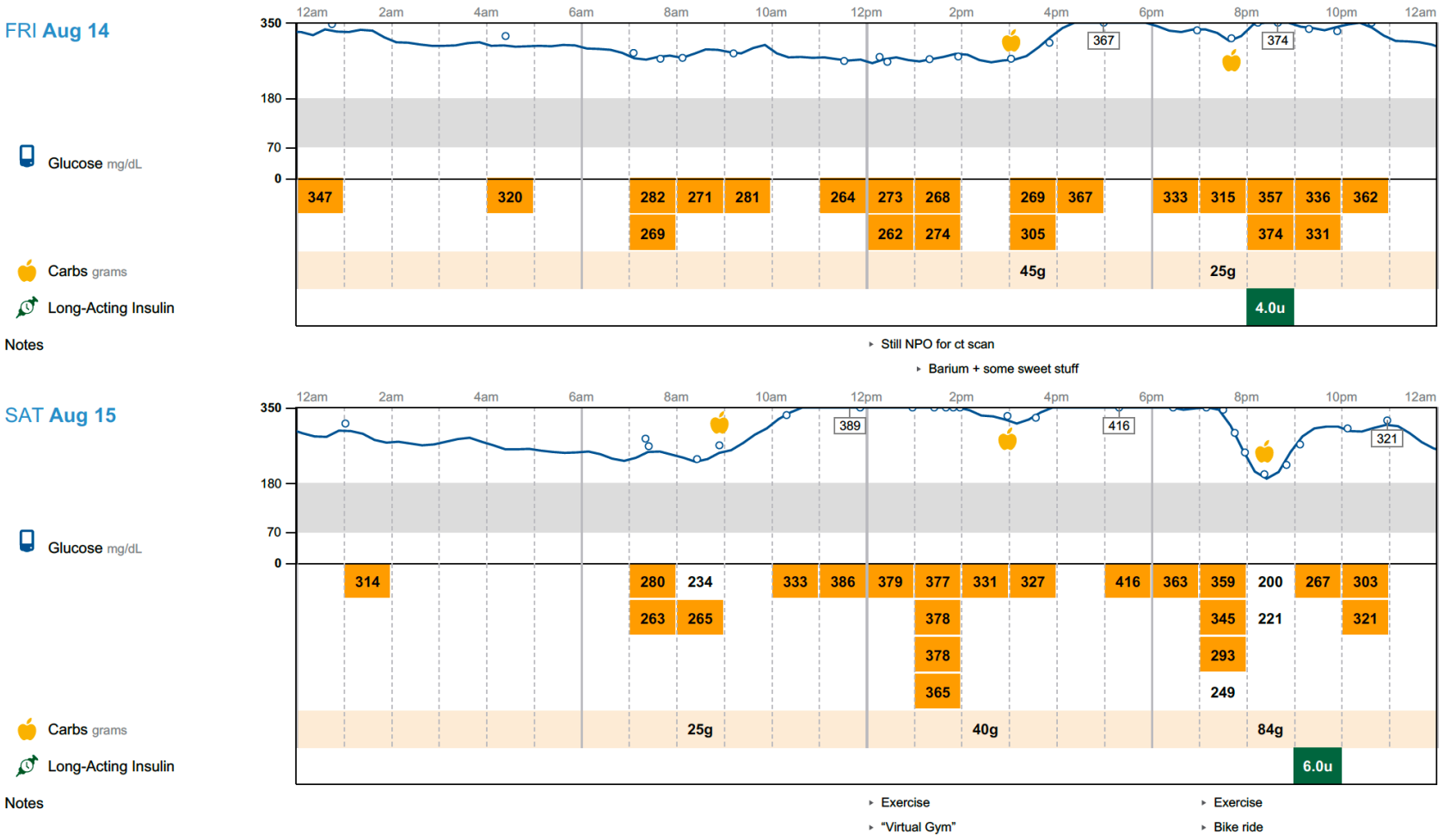
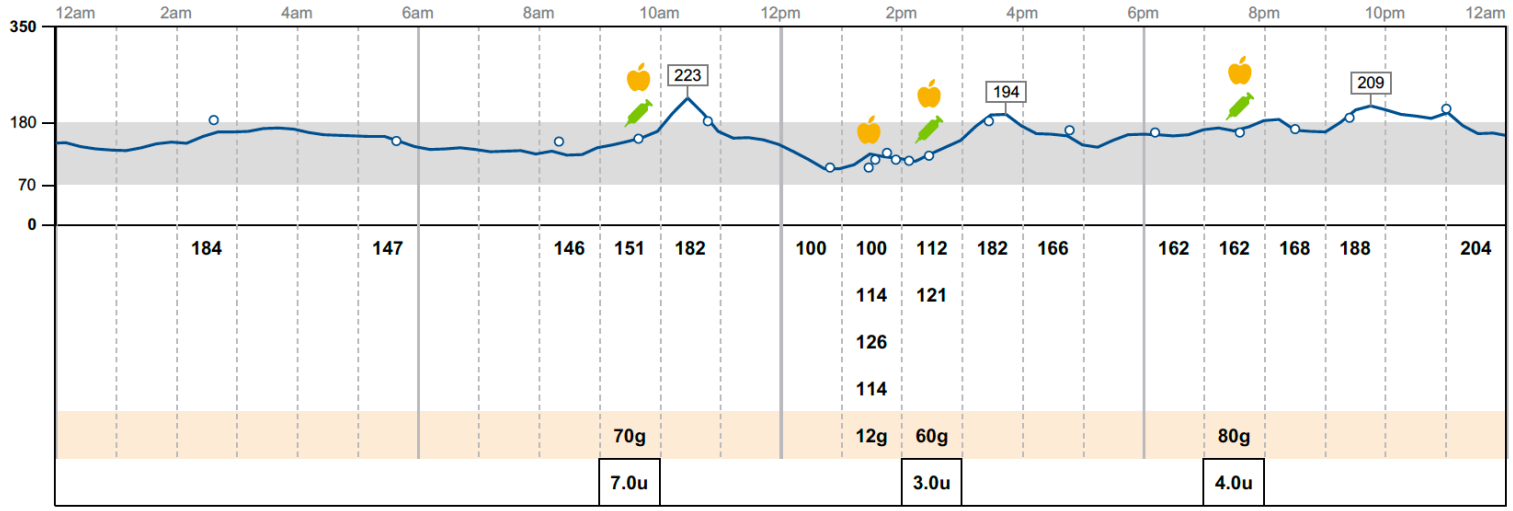


New Onset T1D



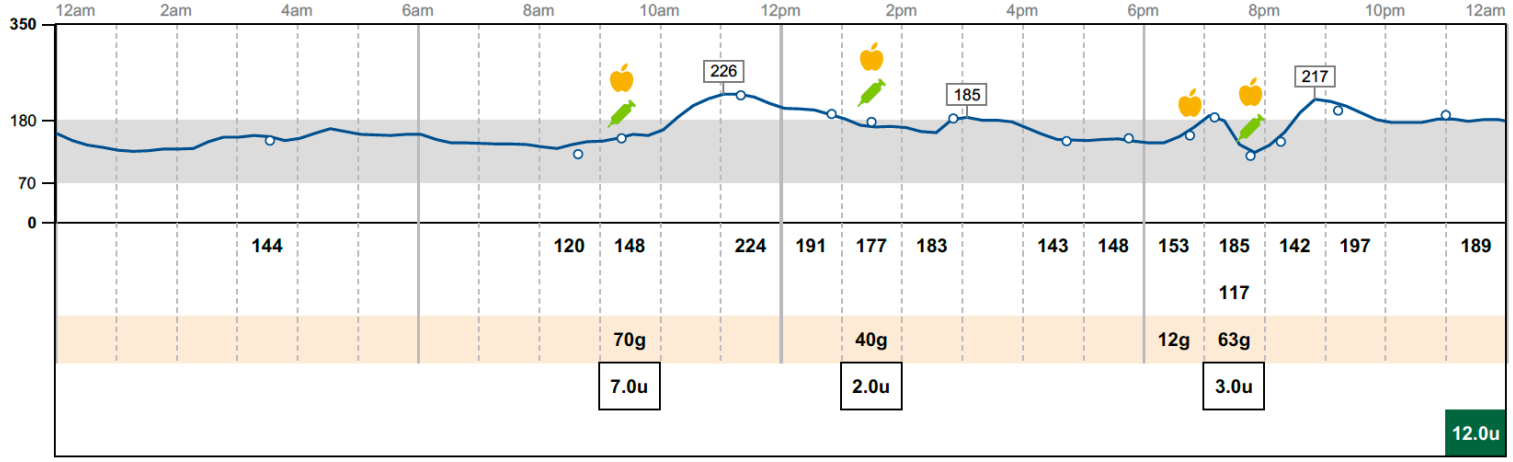
MON **Aug 31**



Notes

- Exercise
  - Brisk walk on way to Cedars
- Exercise
  - Swim with pre-swim carb load
- Exercise
  - Walk starting at 8:10pm, ends 8:30

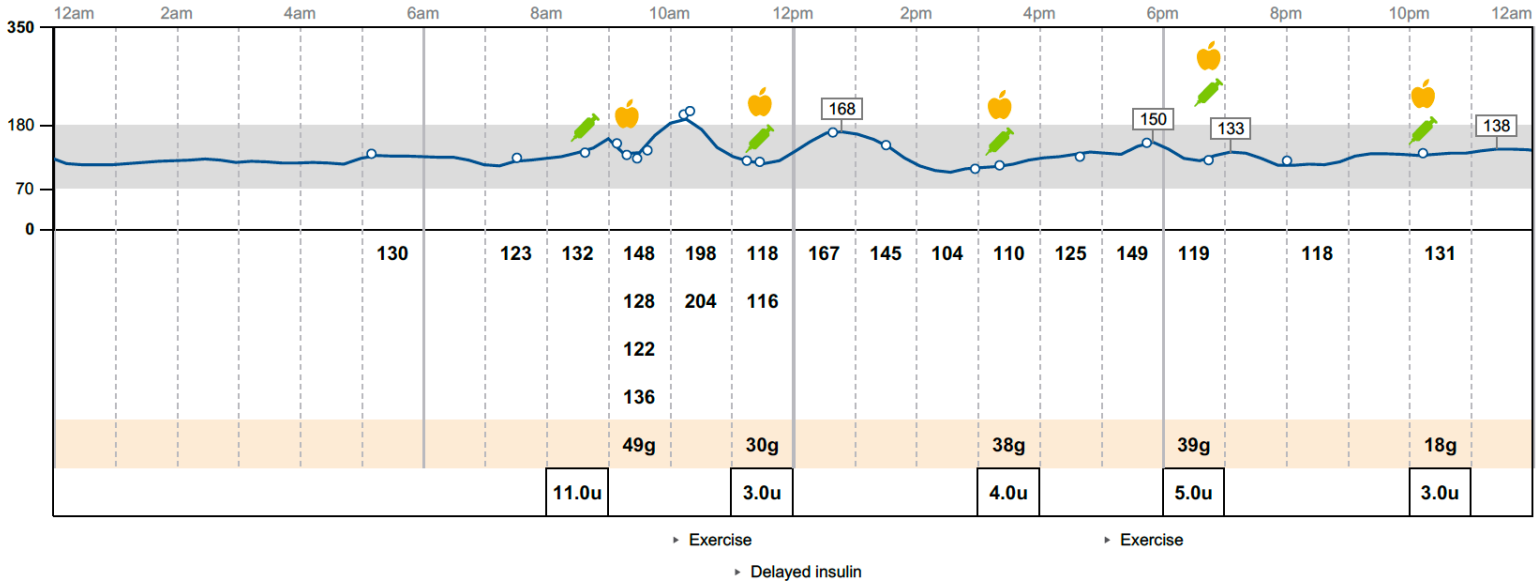
TUE **Sep 1**



Notes

- 10 min walk
- Exercise
  - Bike ride

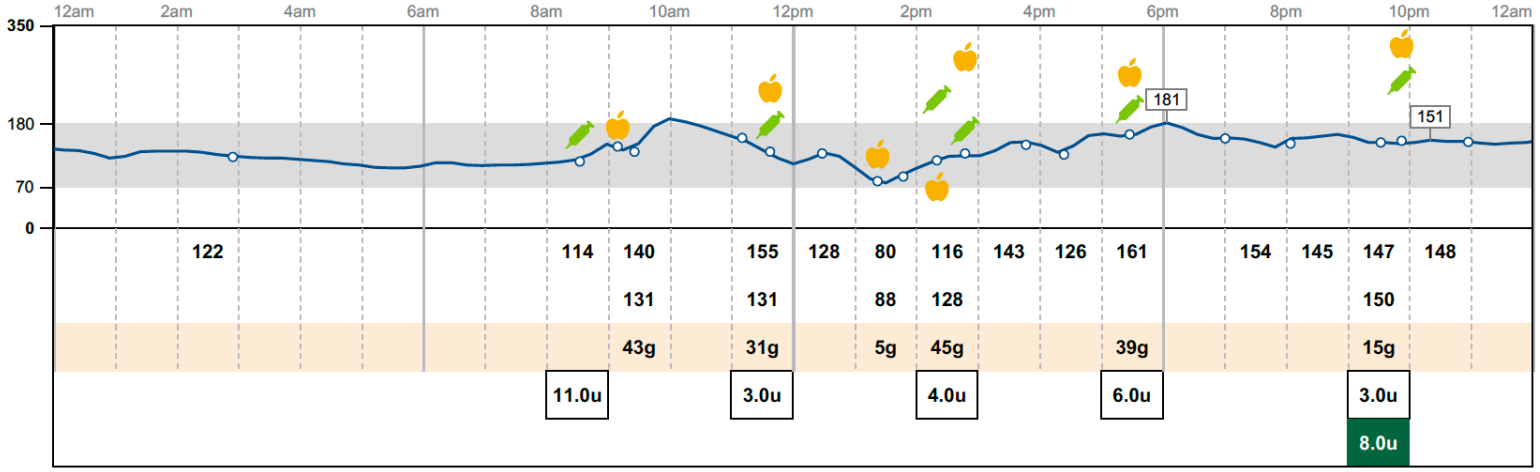
MON **Sep 28**



Notes

- Exercise
- Exercise
- Delayed insulin

TUE **Sep 29**



Notes

- Exercise
- Exercise
- PT
- Walk

Depression and Recurrent Severe Hypoglycemia

C Shumake
DOB: 01/25/1992
MRN: _____
DEVICE: FreeStyle LibreLink

USC Westside Center for Diabetes
PHONE: 310-272-8222
PAGE: 1 / 1
GENERATED: 10/18/2020

AGP Report

September 21, 2020 - October 4, 2020 (14 Days)

LibreView

GLUCOSE STATISTICS AND TARGETS

September 21, 2020 - October 4, 2020	**14 Days**
% Time CGM is Active	**93%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges	**Targets** % of Readings (Time/Day)
Target Range 70-180 mg/dL	Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)

Each 5% increase in time in range (70-180 mg/dL) is clinically beneficial.

Average Glucose	**115** mg/dL
Glucose Management Indicator (GMI)	**6.1%**
Glucose Variability	**37.3%**

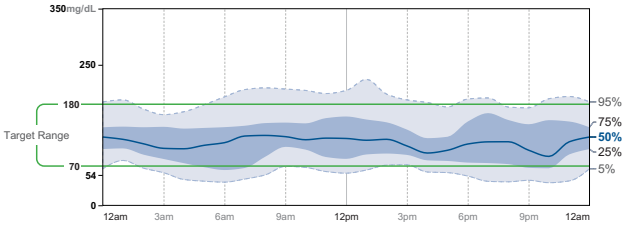
Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES

Very High >250 mg/dL	**0%**	(0min)
High 181 - 250 mg/dL	**8%**	(1h 55min)
Target Range 70 - 180 mg/dL	**76%**	(18h 15min)
Low 54 - 69 mg/dL	**11%**	(2h 38min)
Very Low <54 mg/dL	**5%**	(1h 12min)

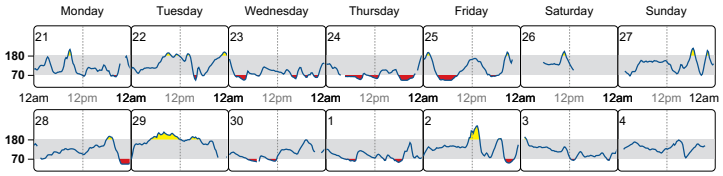
AMBULATORY GLUCOSE PROFILE (AGP)

AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if occurring in a single day.



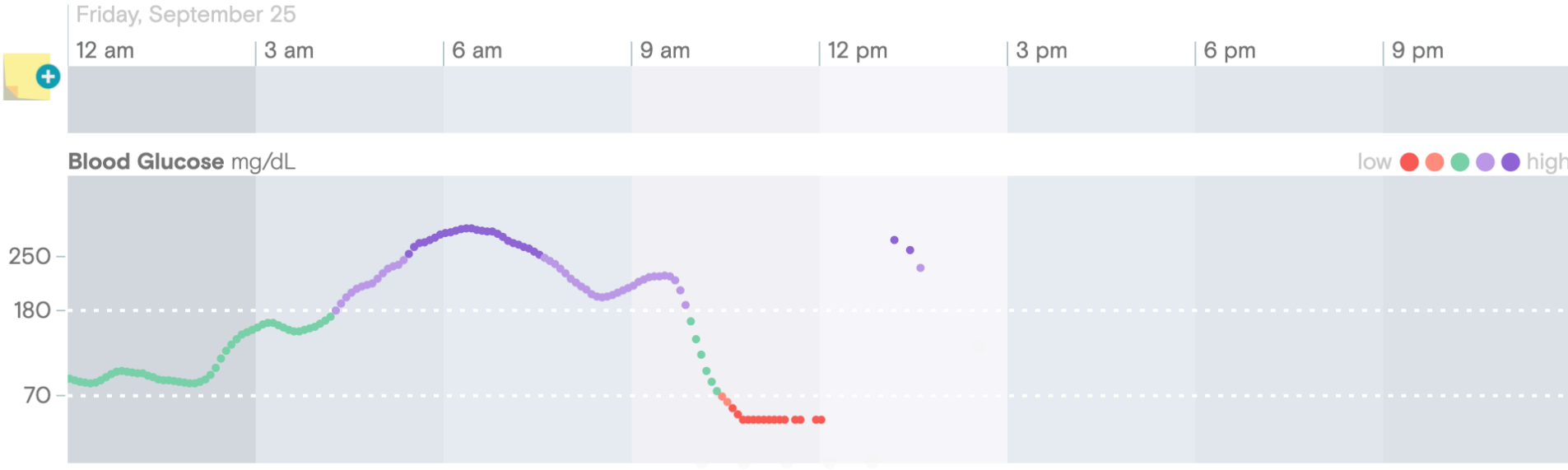
DAILY GLUCOSE PROFILES

Each daily profile represents a midnight to midnight period with the date displayed in the upper left corner.

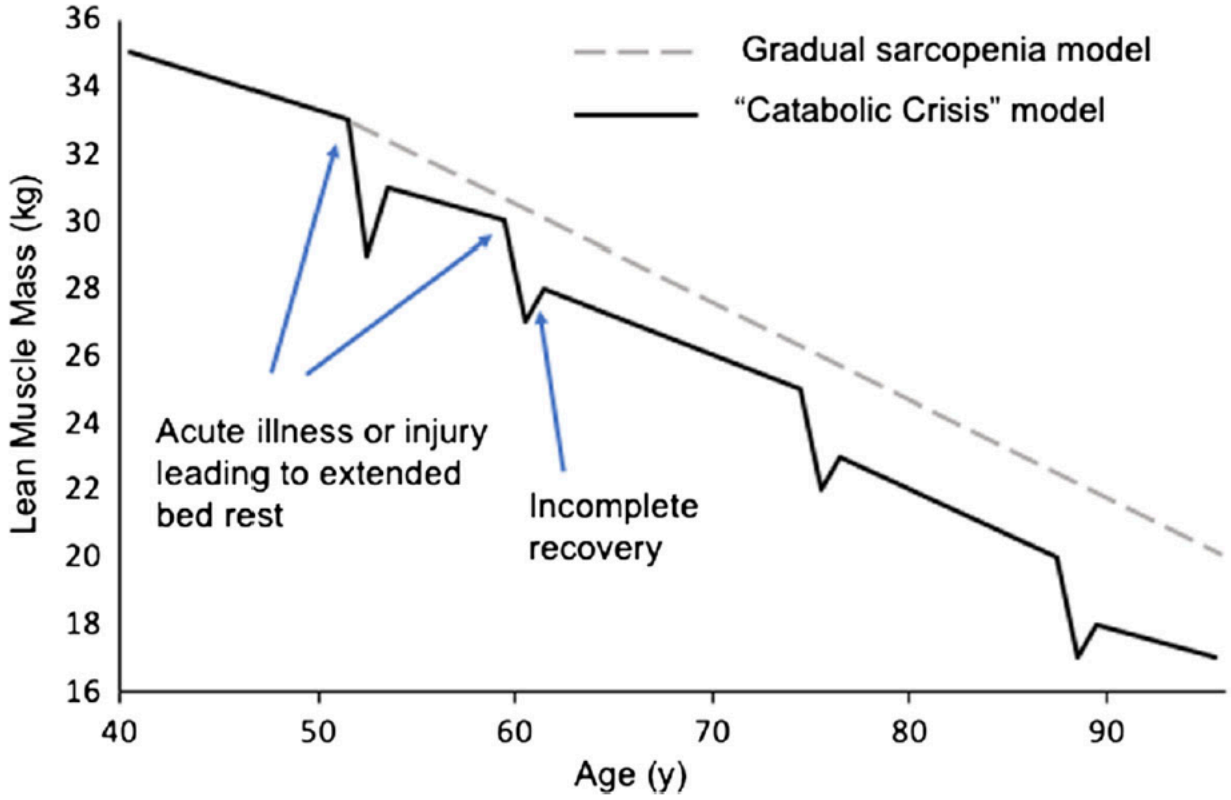


Source: Battelino, Tadej, et al. "Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range." Diabetes Care, American Diabetes Association, 7 June 2019, https://doi.org/10.2337/dci19-0028.

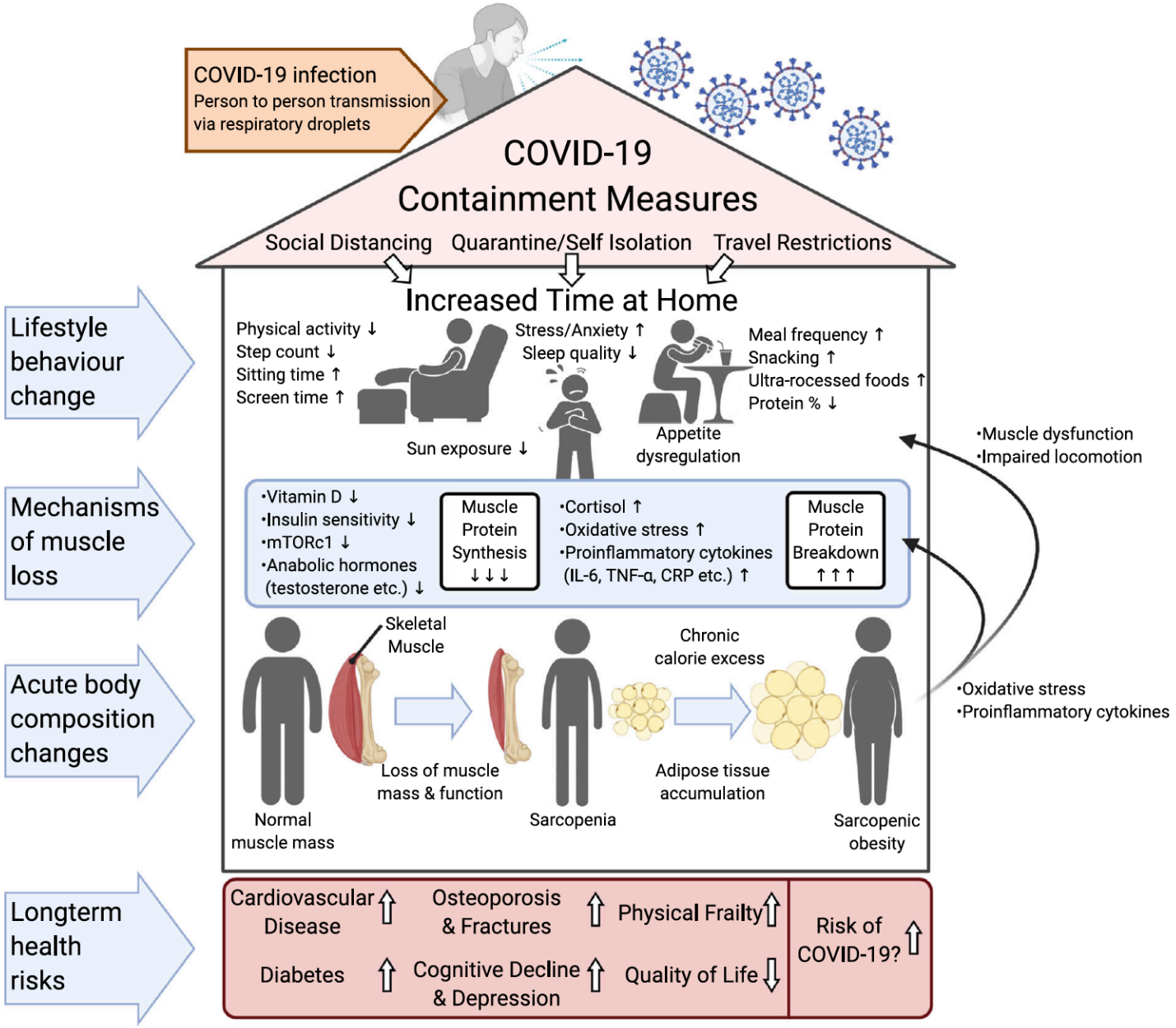
Relapse


Friday, September 25
12 am
3 am
6 am
9 am
12 pm
3 pm
6 pm
9 pm
Blood Glucose mg/dL
low
high
250
180
70

Sacropenia and COVID

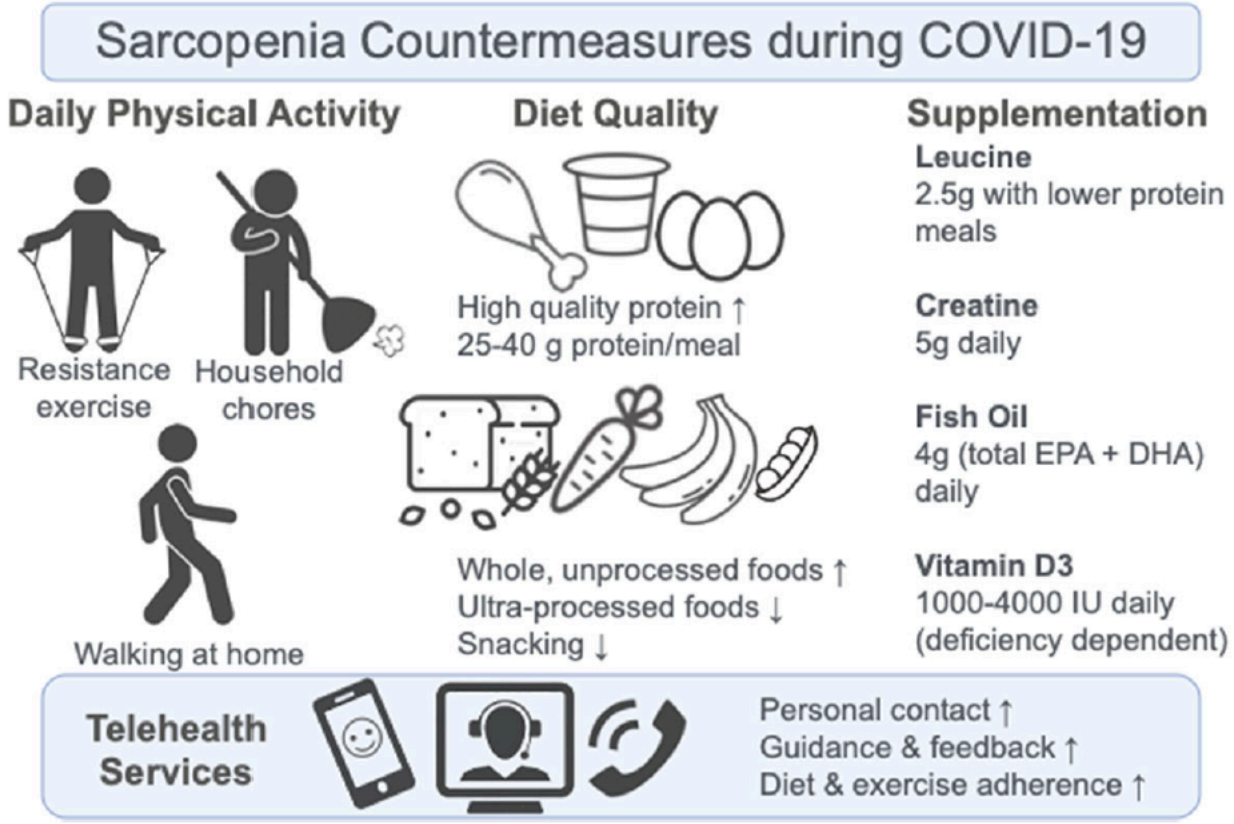


Geroscience. 2020 Oct 1:1–32. doi: 10.1007/s11357-020-00272-3.



Geroscience. 2020 Oct 1:1–32. doi: 10.1007/s11357-020-00272-3.

Sacropenia and COVID



Geroscience. 2020 Oct 1:1–32. doi: 10.1007/s11357-020-00272-3.

What to do going forward

- Create systems to get everyone who needs them on SGLT-2 inhibitors/GLP-1RA's due to glucose/renal/cardiac/HF benefits
- Use CGM widely for remote monitoring as well as real-time adjusting
- Develop hybrid systems of in-person and telemedicine visits that can be customized to the individual patient
- Focus on the mental health components to care—an increasing concern

THANK YOU