

19
07
CT

IT IS

21
07
JHB

19
07
CT

TIME TO

21
07
JHB

19
07
CT

SHIFT FOCUS

21
07
JHB

Food as Medicine

“Let food be thy medicine...” – Hippocrates (400 BC)?

No single definition of Food as Medicine

Prioritising diet in an individual’s health plan

Food as Medicine

Perspectives on nutrition and diabetes reversal

Dr Sofia Monteiro & Dr Kate Larmuth



↑ SH____.FT FOCUS.

Nutrition central in many traditional forms of medicine.

Role declined in last century.

“Food as medicine” challenges conventional Western Medicine

Shifting
focus...

Interdisciplinary
collaboration

stylised
facts?

Behavioural Economist

Sofia Monteiro, PhD



Medical Biochemist

Kate Larmuth, PhD



State of the problem

The burden of lifestyle driven diseases



Diabetes: the problem

- World (2021) - 537mil people (9.3%)
- SA (2019): 4.58 mil people
 - “unhealthiest country on earth”
 - #1 underlying cause of death in women
- Risk of death 50% higher
- 4x medical cost (to increase 50% 2010 – 2030)
- Public Sector costs
- Complications - heart disease, blindness, kidney failure, lower-extremity amputations

→ 67% of SA
prediabetic

→ burden on patients, families, insurers, economy.



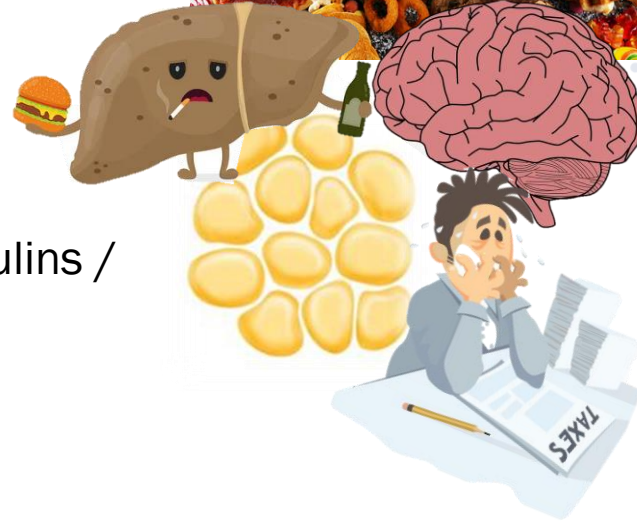
State of the problem

Diet is a major contributor to the problem!

Ultra-processed foods believed to play a predominant role

Insulin Resistance

- Glucose – Fuel for our cells
 - Pancreatic hormone - Insulin
 - Diabetes = Cells don't respond to Insulins / Not enough Insulin
 - Build up of Glucose = sugary blood /Hyperglycemia



State of the problem

Diet is a major contributor to the problem!

Ultra-processed foods believed to play a predominant role

Insulin Resistance

- **CARBS – INSULIN – REWARD:**
 - Chronic positive energy balance,
 - Total Carbs == **HOMA-IR**
 - Carbs promote **hedonic eating** - Addiction
 - **Carbs significantly increase SNS activity,**
 - which chronically $\uparrow$ BP
 - Muscles (Increased blood Glucose)
 - Liver slows down



Diabetes: Remission is possible

Bariatric surgery

Severe calorie restriction (850 kcal/d or less)

RCTs, meta-analyses, narrative reviews

+ ↑ consumption of healthy fats....

Compared to control diets, low carb diets consistently improve metabolic health.



20% Protein
70% Fats
10% Carbs



Diabetes: food solutions

Low carb, healthy fats

- ↑ satiety
- ↑ Fat for energy
- ↓ sympathetic nervous system stimulation
- ↑ insulin sensitivity of liver and fat cells
- Ketones alleviate inflammatory processes
- Stop stimulating reward/addictive pathways that Carbohydrates lay down



Real food is medicine

Carbohydrates
potentially poison

Nudging healthier habits

Continuous Glucose Monitoring

Lifestyle change is a huge challenge

• Fingerprick misses “silent killer”

• Digital health monitoring technologies
>>> offer innovative solutions?



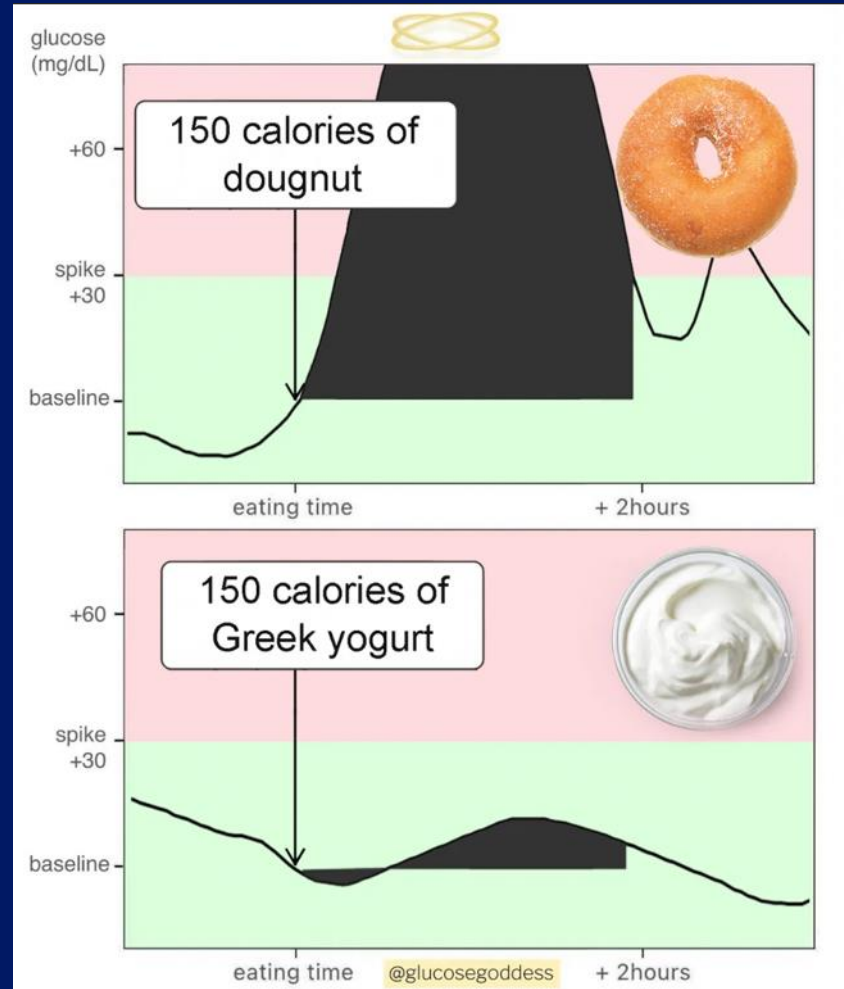
90%
of non-diabetics
experience
glucose spikes

@glucosegoddess

Problem of frequency of feedback



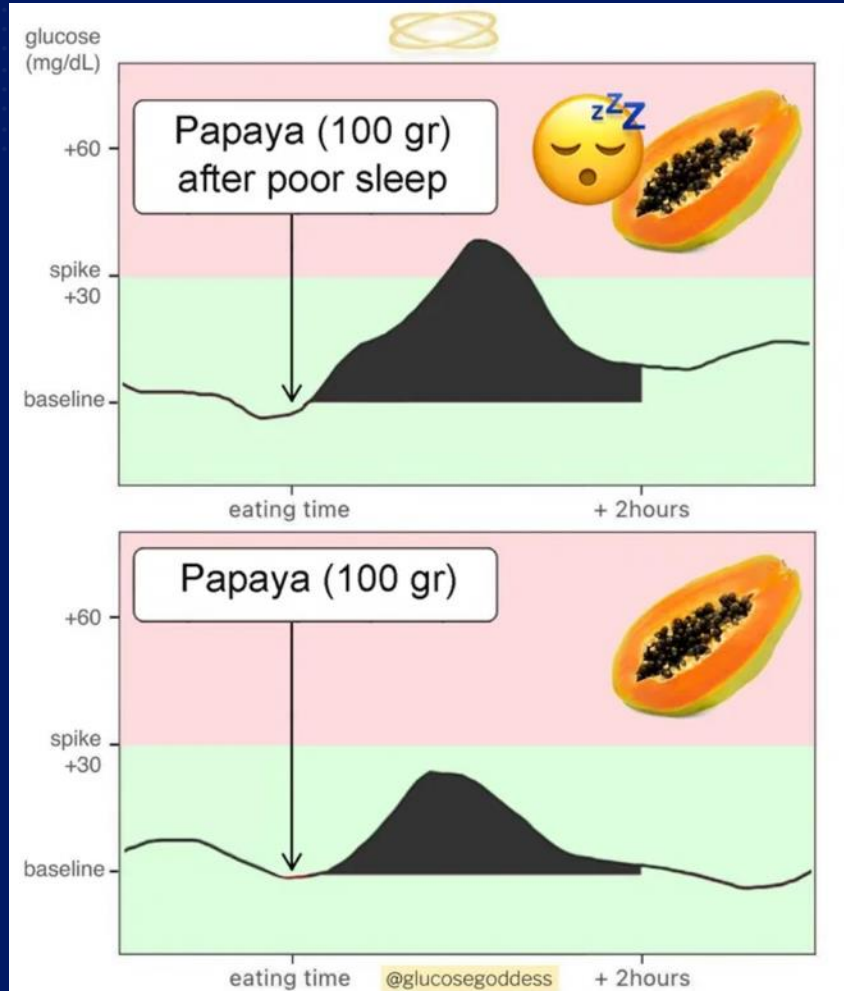
Number of calories
says nothing about
the glucose spike!



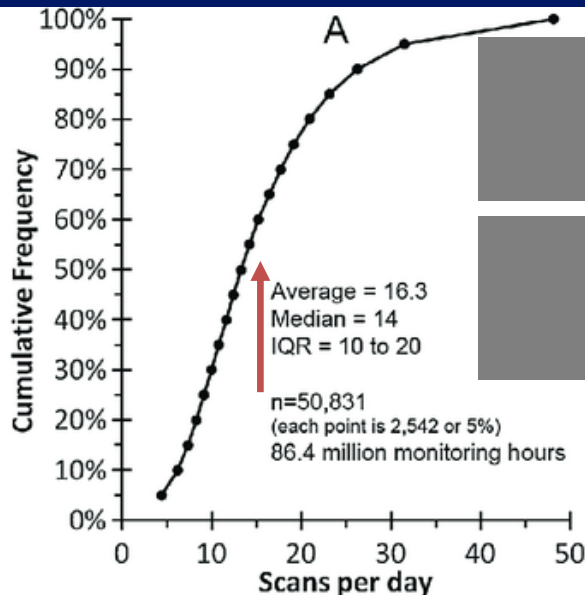
Other lifestyle factors

- Stress
- Sleep
- Physical activity

affect glucose responses
to high carb foods



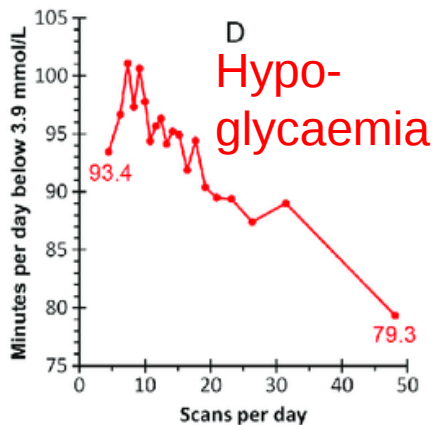
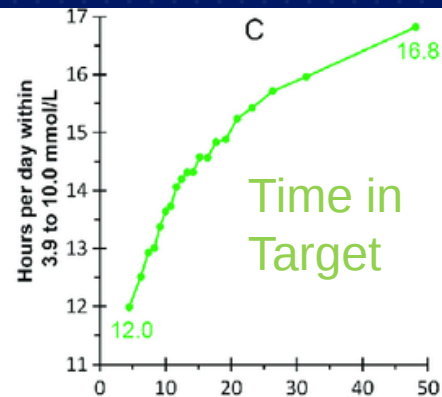
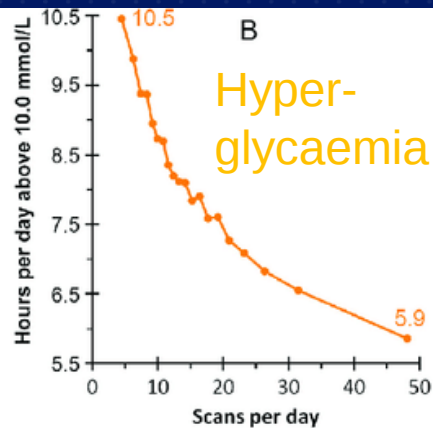
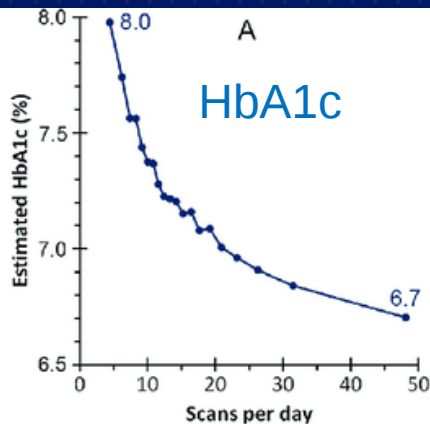
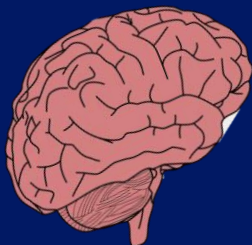
How often would we check glucose if it didn't hurt?



AVERAGE FINGERPRICKS: 2.1

AVERAGE SCANS: 16

Remove (pain) cost of monitoring
>>>> 8x engagement



MORE
ENGAGEMENT
>>>>
MORE
CONTROL



Why do we need health coaching?

WHAT'S NEEDED	CONVENTIONAL
Health-oriented	Disease-oriented
Collaborative, patient-centered model	Expert, doctor-centered model
Biochemical individuality	Everyone treated the same way
Cost-effective	Expensive
Relieves symptoms by addressing cause	Suppresses symptoms with drugs
Preventative approach	Early detection of disease
High-touch and high-tech	High-tech

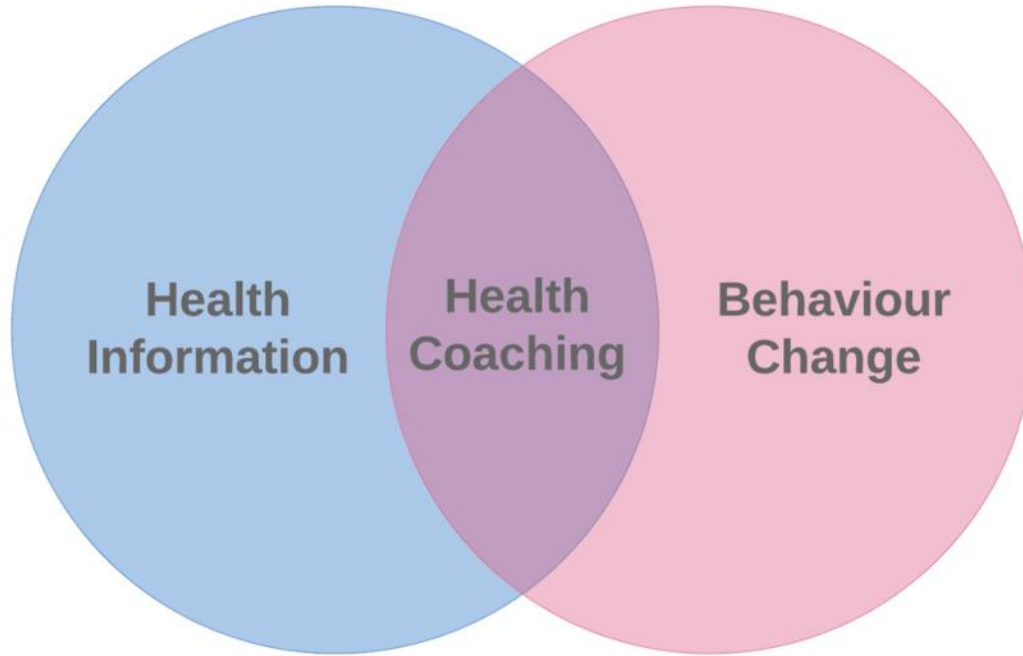
Acute, infectious diseases were the leading cause of death...

...now it's the slow burn of lifestyle.

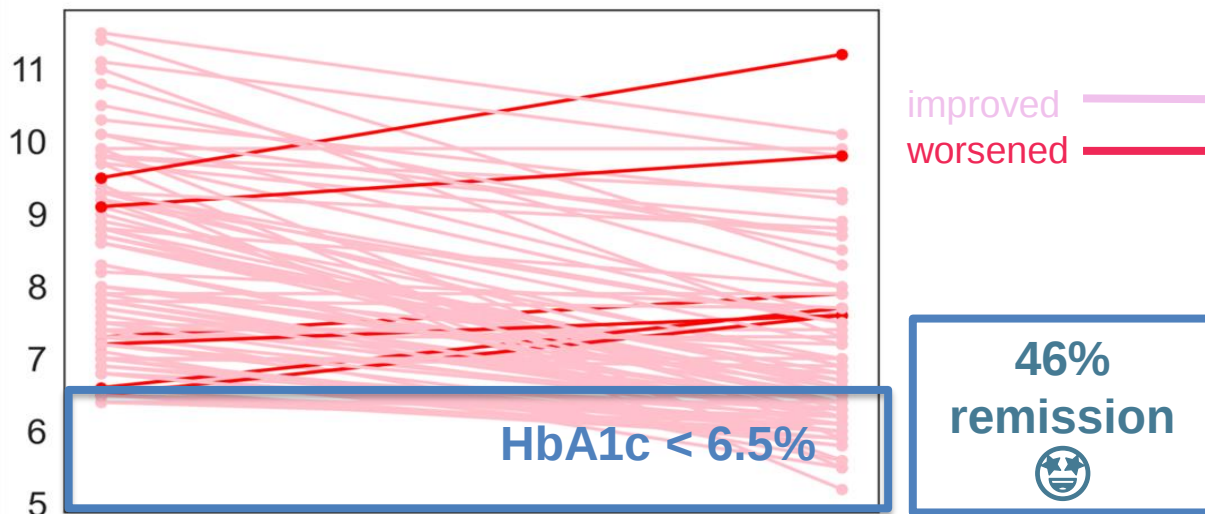
Do we need a different treatment model to address the root cause of the disease burden?

Today things aren't quite so simple...

Behaviour change specialists as part of a multidisciplinary team



How can we support T2DM patients to achieve remission and healthy food habits?



In the end, we all have the *same goal...*
It's an ideological empirical question what works.

laurenkimwellness 2h

Client transformation:
-lost 18kg, 9cm around waist
-off diabetic meds
HbA1c 5.6. 🔥🔥🔥

chesteralex

chesteralex Suffering from obesity, being diabetic I decided to change my life around. My 36 year journey has taken a massive jump in the way I live. It's been tough at time... more

You did it! Onwards and upwards 🏆

Send message

S. Monteiro, K. Larmuth, D. Wiesen, J. Kroff, & M. Sutter. (in preparation).
Technology-assisted behavioural interventions in T2DM

Evidence from the field

Randomised controlled trial
95 non-insulin dependent
Type 2 Diabetics
30-65 yrs old
HbA1c eligible: 6.5-11%



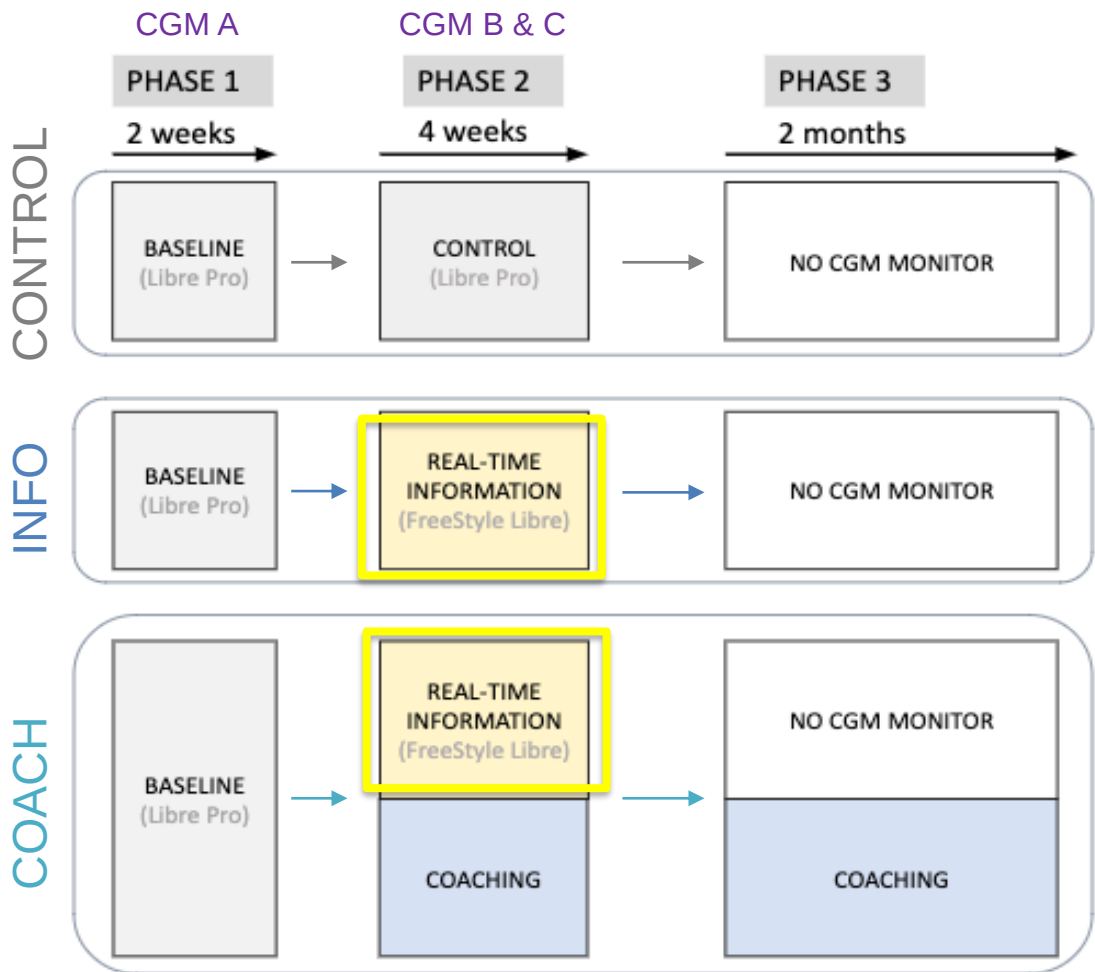
**National
Research
Foundation**



Libre Pro hides info from patient
(REVIEW AT 2 WEEKS ONLY)



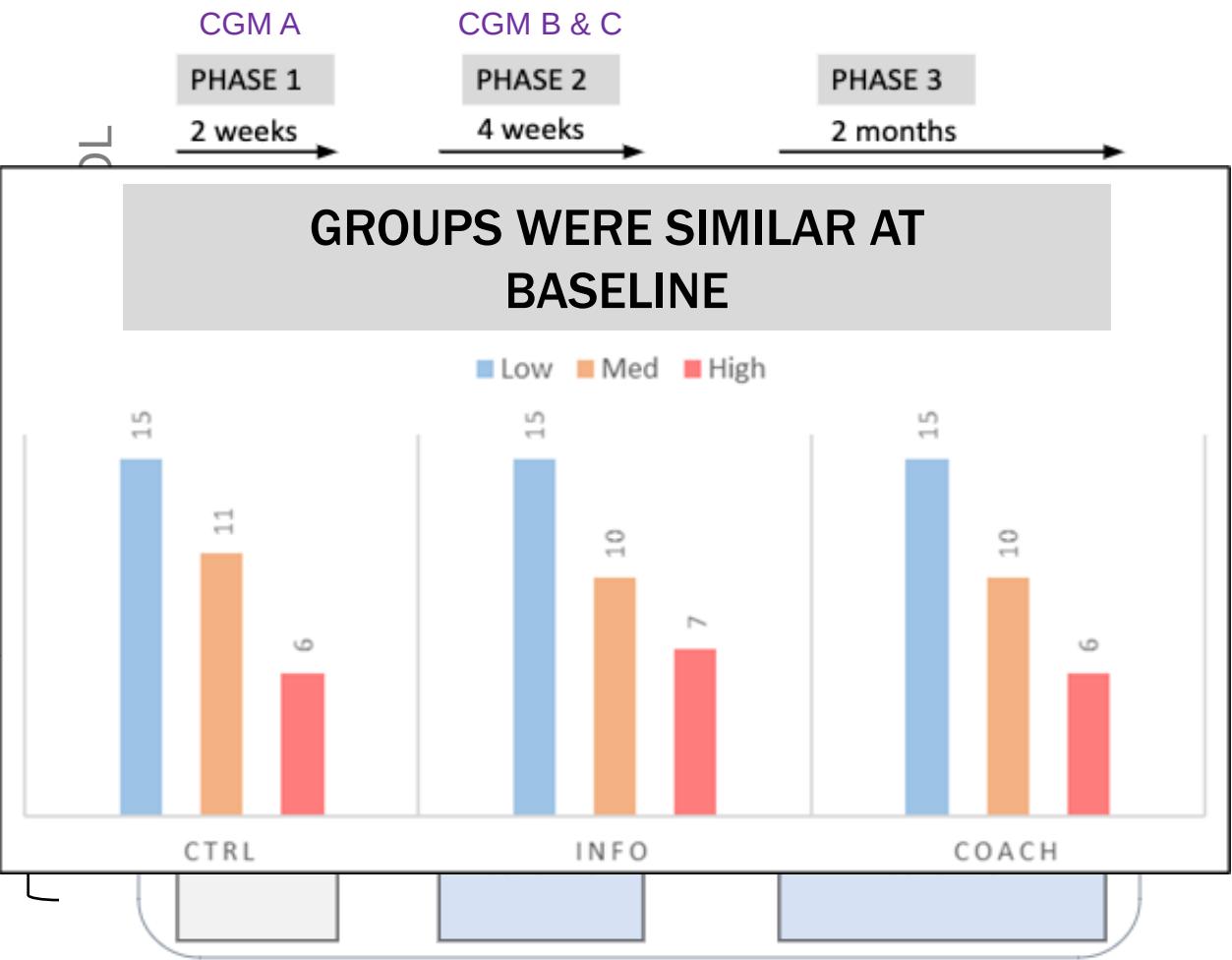
FreeStyle Libre has mobile app
for patient (REAL TIME REVIEW)

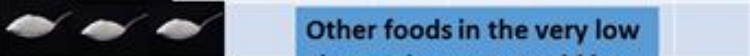
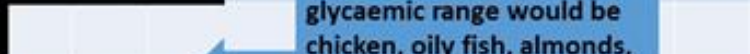
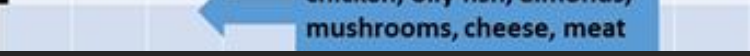


Libre Pro hides info from patient
(REVIEW AT 2 WEEKS ONLY)



FreeStyle Libre has mobile app
for patient (REAL TIME REVIEW)



Food Item	Glycaemic index	Serve size g	How does each food affect blood glucose compared with one 4g teaspoon of table sugar? 
Basmati rice	69	150	10.1 
Potato, white, boiled	96	150	9.1 
French Fries baked	64	150	7.5 
Spaghetti White boiled	39	180	6.6 
Sweet corn boiled	60	80	4.0 
Frozen peas, boiled	51	80	1.3 
Banana	62	120	5.7 
Apple	39	120	2.3 
Wholemeal Small slice	74	30	3.0 
Broccoli	15	80	0.2 
Eggs	0	60	0 

Other foods in the very low glycaemic range would be chicken, oily fish, almonds, mushrooms, cheese, meat

Very low-carbohydrate

<10% carbohydrates
20-50 g/day

+ High healthy fats

Recommendation in SA:
45–65% carbohydrates

Oh R, Gilani B, Uppaluri KR. [2021].
Unwin, D, Haslam, D, Livesey, G. [2016].
<https://phcuk.org/sugar/>



THE GREEN LIST

THE GREEN FOOD LIST IS THE ONLY LIST THAT YOU CAN EAT FROM ON A DAILY BASIS. THESE ARE THE FOODS THAT ARE NUTRITIOUS, LOW IN CARBS PER PORTION AND EXTREMELY HEALTHY. PRACTICING PORTION CONTROL IS STILL IMPORTANT WHEN EATING FROM THIS LIST

THE BANTING POCKET GUIDE QUICK REFERENCE LISTS

For a more extensive list of foods, including the macro nutrient breakdown, please refer to our book The Banting Pocket Guide.



THE ORANGE LIST

THE ORANGE FOOD LIST IS FOR PEOPLE WHO HAVE REACHED THEIR GOAL WEIGHT AND WANT TO INCLUDE SOME VEGETABLES AND BERRIES ON THIS LIST, OR FOR THOSE WHO ARE NOT SENSITIVE TO CARBOHYDRATES AND CAN TOLERATE THESE VEGETABLES AND FRUITS. THIS LIST IS ALSO FINE FOR AN OCCASIONAL SWEET TREAT, BUT ONLY ONCE YOU HAVE REACHED YOUR GOAL WEIGHT. WE HAVE INSERTED THE CARB COUNT HERE SO YOU CAN BE AWARE OF THE HIGHER CARB VALUES:

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THE RED LIST

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RED ITEM FOODS WILL ALMOST ALWAYS CONTAIN INGREDIENTS THAT ARE HARD TO PRONOUNCE

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ALL PRODUCTS CONTAINING ANY OF THESE INGREDIENTS

Atta (chapatti flour)
Breaded or battered foods
Cake flour, Chickpea flour
Corn flour, Durum (wheat)
Malt, Matzo meal, Modified wheat starch
Oatmeal, Oat bran, Whole oats
Potato starch, Rice flour
Semolina, Sorghum, Soy flour
Dried beans, Couscous
Lentils, Pasta, Polenta
Rice, Samp
Split peas, Stampkoring
Wheat germ, Wheat starch

BEVERAGES

Canned coffee - generally containing other ingredients like dextrose, etc
Tea with added artificial ingredients
Fizzy drinks including diet or lite drinks
Cordials, Fruit drinks, Fruit juice
Shakes of any kind
Energy drinks

ALCOHOL

Beer
Ciders
Dessert wine
Liqueurs & Shooters

DAIRY

All low fat/fat free products
Cheese spreads, Processed cheese
Canned cream, Dessert cream
Coffee creamer
Condensed milk
Custard
Flavoured yoghurt
Ice cream
Powdered milk, Rice milk, Soy milk

FATS AND OILS

All commercial fat spreads/margarine
Flavoured butters
Canola oil, Corn oil
Cottonseed oil, Grapeseed oil, Soybean oil, Sunflower oil

SAUCES AND DRESSINGS

All commercial sauces and dressings
Barbeque sauce, Cook in sauce, Marinades, Mustard sauce, Peri-peri sauce, Pasta sauce, Salad creams and dressings
Tomato sauce
Sweet sauces

FAST FOOD AND TAKEAWAYS

Burgers, Hot dogs, Spare ribs, Crumbed chicken or fish
Fries, Wraps, Pizza, Hotdogs

MEAT AND FISH

All meat that has been cured with sugar and/or marinated meats with added ingredients
Corned meat
Cold processed meats, e.g. sandwich ham/ham/chicken/beef, etc generally found at the deli
Crumbed/battered meat, e.g. crumbed chicken, hamburger patties, chicken nuggets, meat pies, readymade meals, meat free products (soy), fish bakes, crumbed fish fingers
Pilchards in tomato sauce
Tuna in vegetable oil

FRUIT AND VEGETABLES

Dried fruit - all varieties
Legumes
Corn
Potatoes

SWEETENERS

Agave
Aspartame
Blackstrap molasses
Cane sugar, Beet sugar
Castor sugar
Coconut sugar, Date sugar
Carob syrup, Corn syrup, Maple syrup
Dextrose
Fructose
Glucose
Maltitol
Saccharin
Sorbitol
Sucralose
Table sugar
Tapioca sugar
Treacle



THE BANTING POCKET GUIDE



Very low-carbohydrate
<10% carbohydrates
20-50 g/day

+ High healthy fats

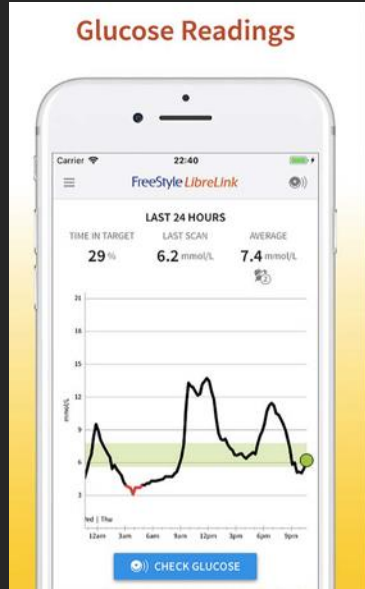
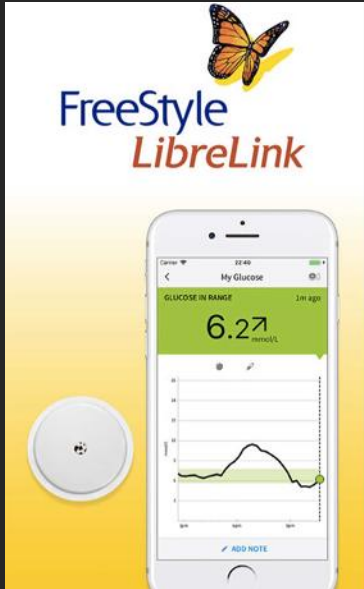
Recommendation in SA:
45-65% carbohydrates

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<https://phcuk.org/sugar/>

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dialogues 2022

↑ SH...FT FOCUS.

Real-time CGM feedback



INFO AND COACH

Current level, trend, past 8 hours

Average glucose

Time in Target

When do I spike?

Physician-supervised CGM feedback

CONTROL

AGP Report

5 June 2020 - 18 June 2020 (14 Days)

GLUCOSE STATISTICS AND TARGETS

5 June 2020 - 18 June 2020

14 Days

% Time CGM is Active

95%

Ranges And Targets For

Type 1 or Type 2 Diabetes

Glucose Ranges

Target Range 3.9-10.0 mmol/L

Below 3.9 mmol/L

Below 3.0 mmol/L

Above 10.0 mmol/L

Above 13.9 mmol/L

Targets % of Readings (TimeDay)

Greater than 70% (18h 45min)

Less than 4% (50min)

Less than 1% (14min)

Less than 20% (8h)

Less than 5% (1h 12min)

Each 5% increase in time in range (3.9-10.0 mmol/L) is clinically beneficial.

Average Glucose

4.2 mmol/L

Glucose Management Indicator (GMI)

5.1% or 32 mmol/mol

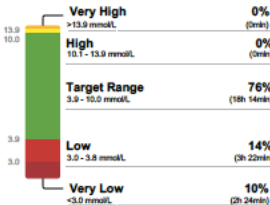
Glucose Variability

21.4%

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

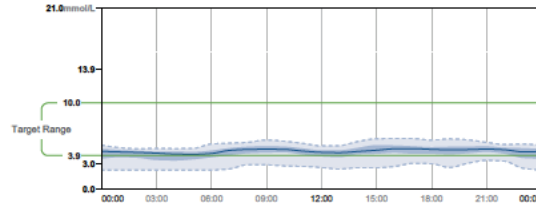
LibreView

TIME IN RANGES



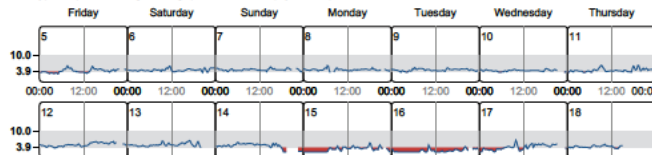
AMBULATORY GLUCOSE PROFILE (AGP)

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 top-left corner.



Time in Target & average glucose

When do I spike?

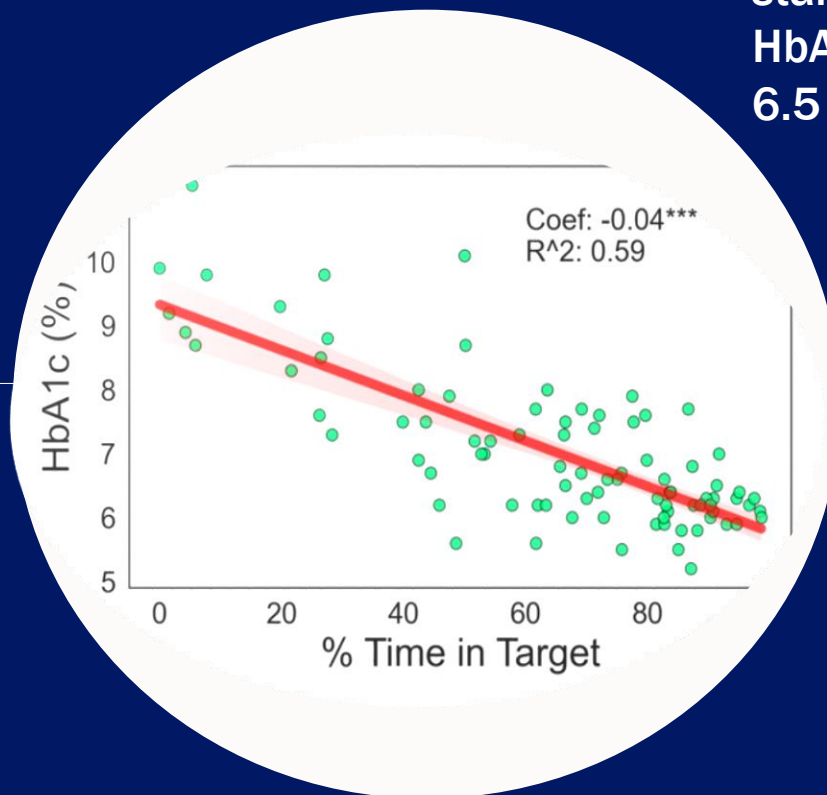
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↑ SH...FT FOCUS.

All patients
started with
HbA1c
6.5 - 11%

Key findings

46% of all patients achieved
remission



Average glucose

Significant decrease in glucose levels by all groups while wearing the CGM

Phase 1

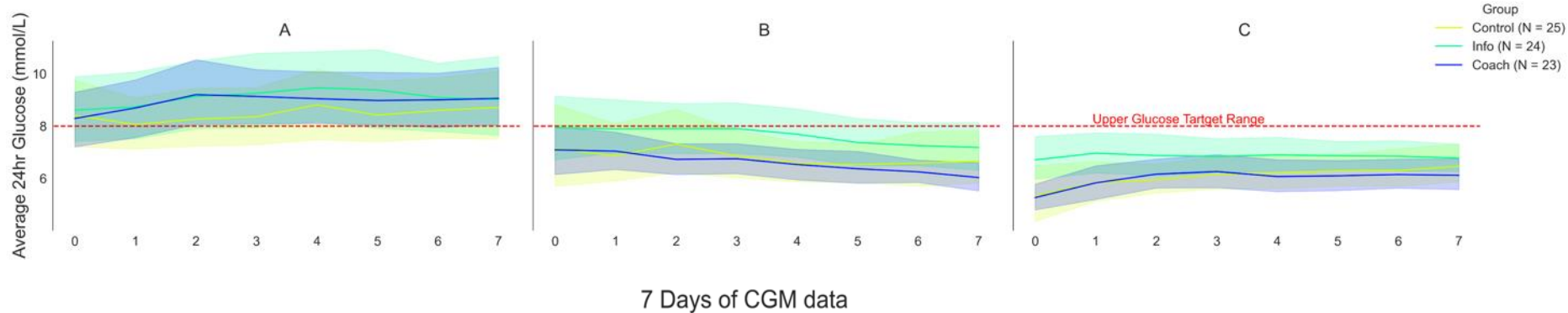
CGM A:

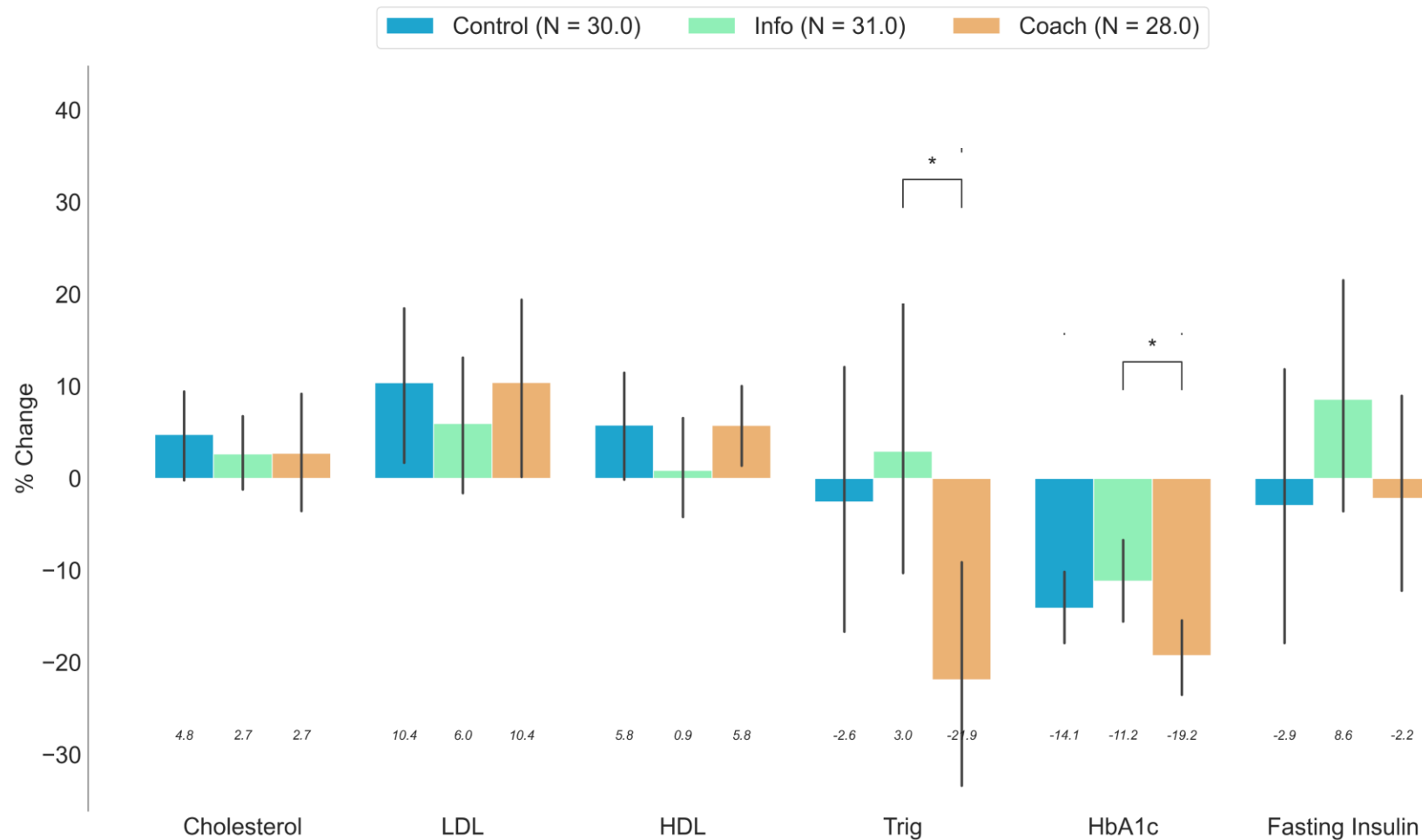
Baseline usual diet habits

Phase 2

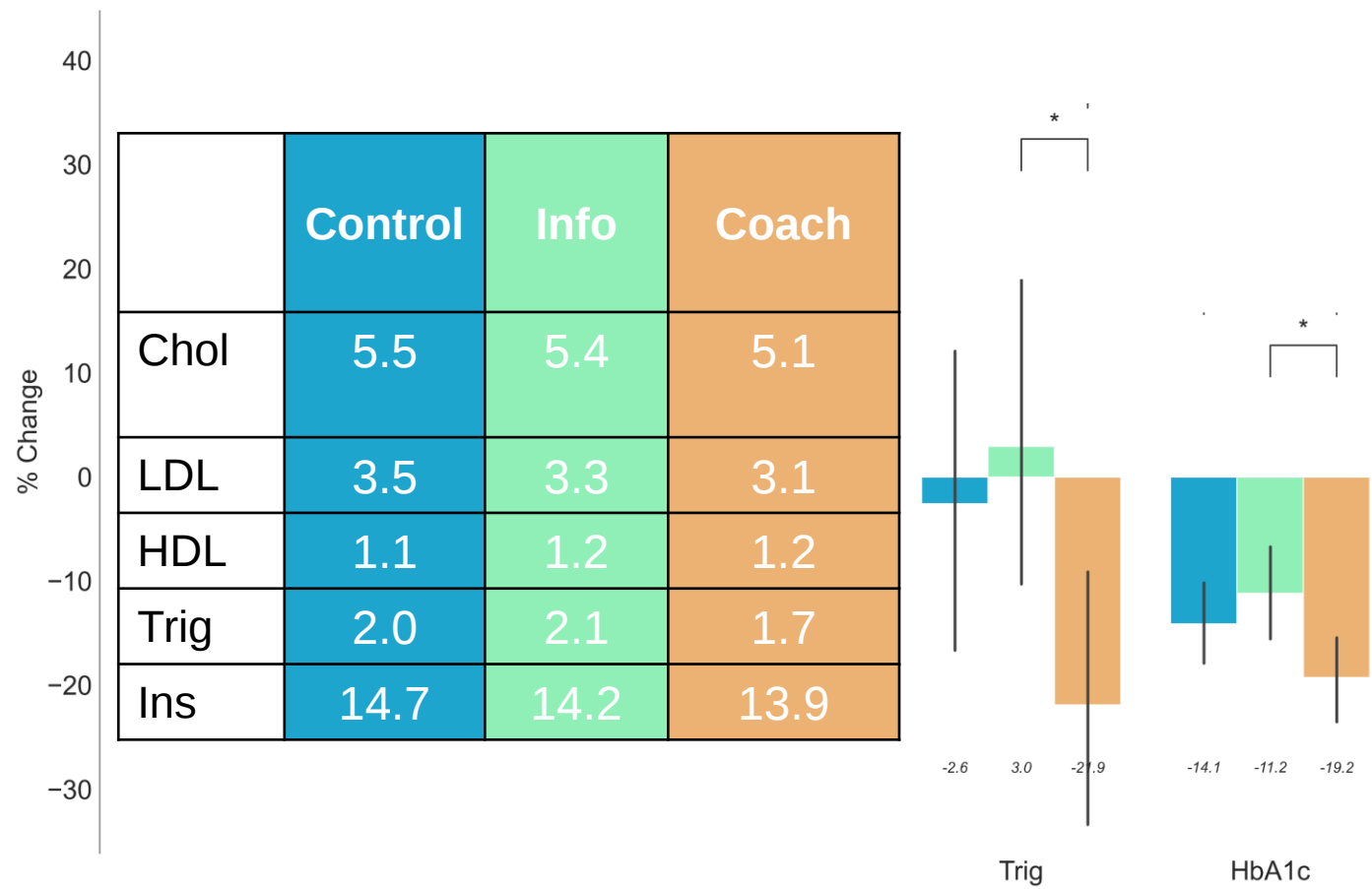
CGM B & C:

Post keto-nutrition education



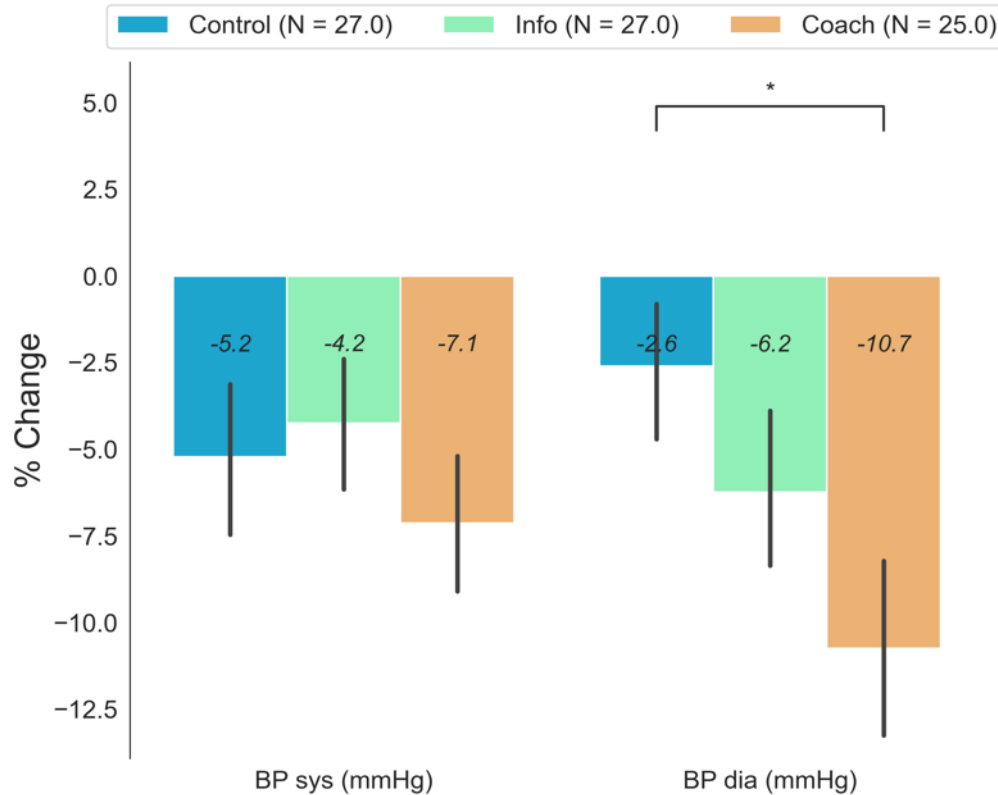


Control (N = 30.0) Info (N = 31.0) Coach (N = 28.0)



Coaching
>>>>
Compliance

Blood Pressure



We expected decreases in BP

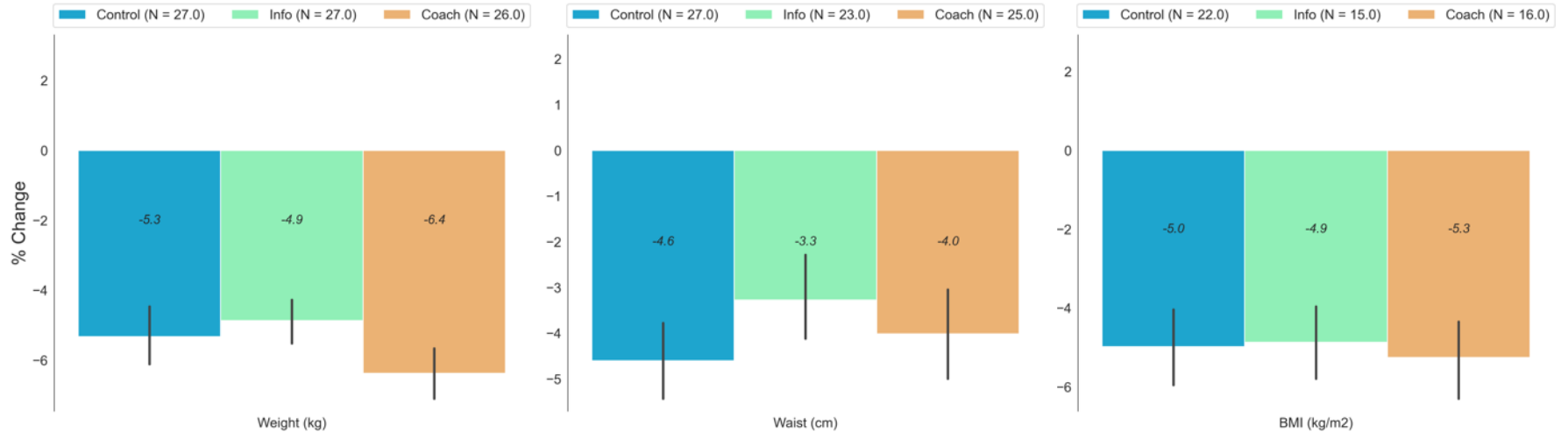
For all changes:
Coach > Info > Ctrl

Welch t-test independent samples, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.0001$

What we expected from following the given nutritional advice:

Decreases All measures of Weight
For all changes:
Coach > Info > Ctrl

Weight



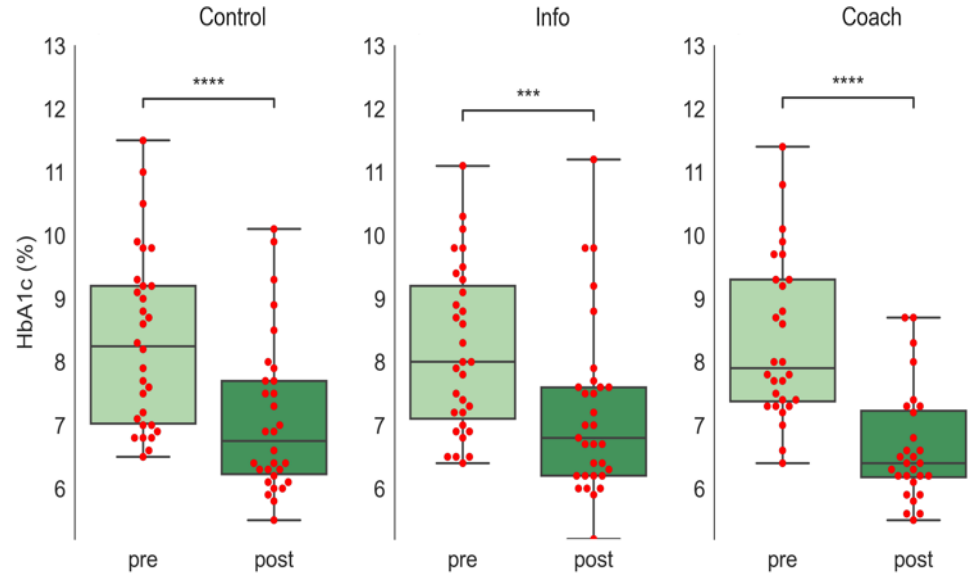
Significant HbA1c decreases 46 % remission

Baseline → Final

Control 8.3% → 7.1%

Info 8.2% → 7.2%

Coach 8.4% → 6.7%

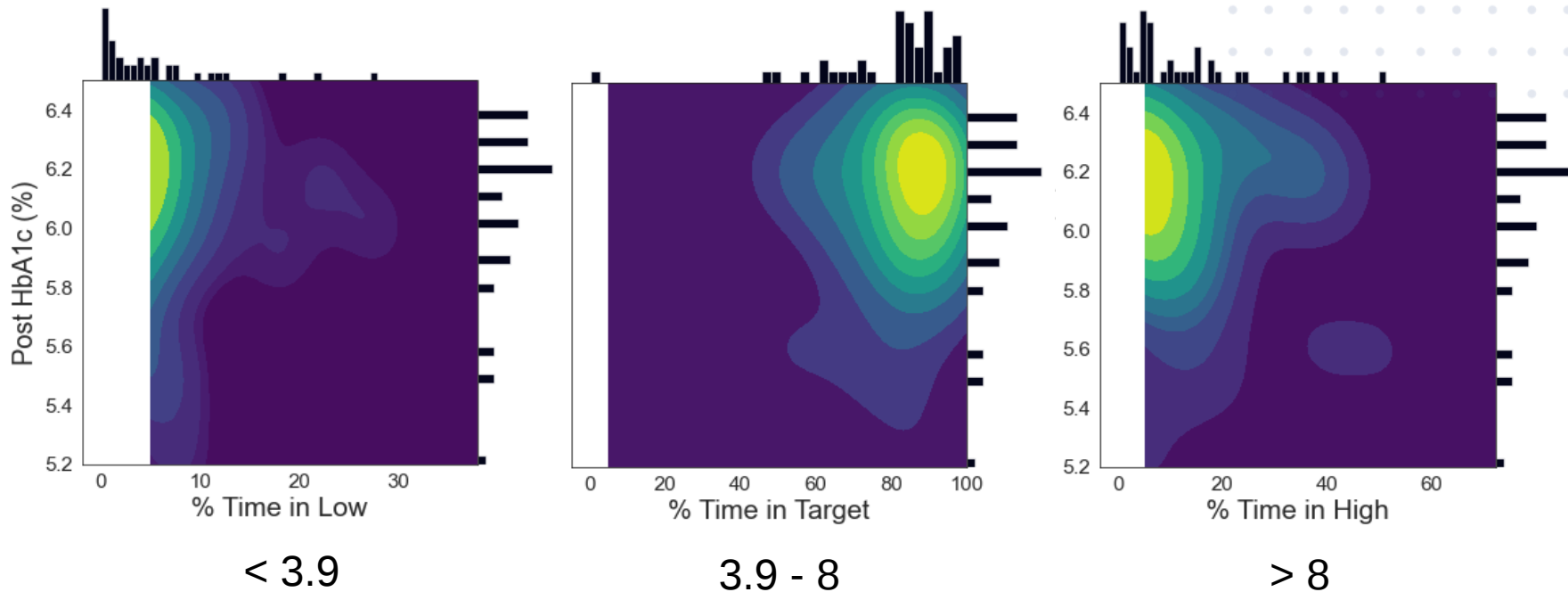


t-test paired samples, ***: $p \leq 0.0001$, ****: $p \leq 0.00001$

Density plots of our “remissions” N=41

They spent less time in in Low and High
and more time in Target

CGM= meaningful signal of
behaviour improvements



Ordinary Least Squares Regression Models (HbA1c)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
HbA1c pre	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post
	0.54***	0.43***	0.43***	0.42***	0.090	0.057	0.11	0.10	0.17
	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.13)	(0.10)	(0.10)	(0.11)
realtime	0.18	0.31	0.31	0.34	0.031		-0.0066	-0.089	-0.023
	(0.26)	(0.22)	(0.23)	(0.23)	(0.18)		(0.18)	(0.20)	(0.20)
coach	-0.64**	-0.51**	-0.50**	-0.53**	-0.27	-0.18	-0.24	-0.15	-0.18
	(0.25)	(0.23)	(0.22)	(0.22)	(0.19)	(0.19)	(0.19)	(0.22)	(0.21)
RED portions / week (post)		0.021***	0.021***	0.020***	0.0057	0.015**	0.0045	0.0019	0.0024
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
ORANGE portions / week (post)			0.0087	0.023	0.077*	0.073	0.076*	0.082*	0.062
			(0.03)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
GREEN portions / week (post)				-0.0059	-0.0015	-0.0011	-0.00068	-0.00067	-0.0017
				(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Time in High range (CGM)					0.026***	0.025***	0.025***	0.026***	0.024***
					(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Mean scans per day						-0.024			
						(0.02)			
Triglycerides post							0.14	0.070	0.064
							(0.10)	(0.11)	(0.10)
% weight gain								0.016	0.021
								(0.02)	(0.02)
Male over 50 years									0.36*
									(0.20)
Female under 50 years									0.30
									(0.30)
Female over 50 years									0.55**
									(0.22)
education									-0.16*
									(0.08)
N	89	85	85	85	83	55	83	76	74
R-sq	0.39	0.50	0.50	0.51	0.70	0.70	0.71	0.70	0.75
Standard errors in parentheses.									
* p < 0.10, ** p < 0.05, *** p < 0.01									



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Corn flour, Durum (wheat)
Malt, Matzo meal, Modified wheat starch
Oatmeal, Oat bran, Whole oats
Potato starch, Rice flour
Semolina, Sorghum, Soy flour
Dried beans, Couscous
Lentils, Pasta, Polenta
Rice, Sump
Split peas, Stamping
Wheat germ, Wheat starch

BEVERAGES

Canned coffee - generally containing other ingredients like dextrose, etc
Tea with added artificial ingredients
Fizzy drinks including diet or lite drinks
Cordials, Fruit drinks, Fruit juice
Shakes of any kind
Energy drinks

ALCOHOL

Beer
Ciders
Dessert wine
Liqueurs & Shooters

DAIRY

All low fat/ fat free products
Cheese spreads, Processed cheese
Canned cream, Dessert cream
Coffee creamer
Condensed milk
Custard
Flavoured yoghurt
Ice cream
Powdered milk, Rice milk, Soy milk

FATS AND OILS

All commercial fat spreads/ margarine
Flavoured butters
Canola oil, Corn oil
Cottonseed oil, Grapeseed oil, Soybean oil, Sunflower oil

SAUCES AND DRESSINGS

All commercial sauces and dressings
Barbecue sauce, Cook in sauce, Marinades, Mustard sauce, Peri-peri sauce, Pasta sauce, Salad creams and dressings
Tomato sauce
Sweet sauces

FAST FOOD AND TAKEAWAYS

Burgers, Hot dogs, Spare ribs, Crumbed chicken or fish
Fries, Wraps, Pizza, Hotdogs

MEAT AND FISH

All meat that has been cured with sugar and/or marinated meats with added ingredients
Canned meat
Cold processed meats, e.g. sandwich ham/ham/chicken/beef, etc
generally found at the deli
Crumbed/battered meat, e.g. crumbed chicken, hamburger patties, chicken nuggets, meat pies, ready-made meals, meat free products (soy), fish bakes, crumbed fish fingers
Pilchards in tomato sauce
Tuna in vegetable oil

FRUIT AND VEGETABLES

Dried fruit - all varieties
Legumes
Corn
Potatoes

SWEETENERS

Agave
Aspartame
Blackstrap molasses
Cane sugar, Beet sugar
Castor sugar
Coconut sugar, Date sugar
Carob syrup, Corn syrup, Maple syrup
Dextrose
Fructose
Glucose
Maltitol
Saccharin
Sorbitol
Sucralose
Table sugar
Tapioca sugar
Treacle

THE BANTING POCKET GUIDE




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Ordinary Least Squares Regression Models (HbA1c)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
HbA1c pre	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post	HbA1c post
	0.54***	0.43***	0.43***	0.42***	0.090	0.057	0.11	0.10	0.17
	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)	(0.13)	(0.10)	(0.10)	(0.11)
realtime	0.18	0.31	0.31	0.34	0.031		-0.0066	-0.089	-0.023
	(0.26)	(0.22)	(0.23)	(0.23)	(0.18)		(0.18)	(0.20)	(0.20)
coach	-0.64**	-0.51**	-0.50**	-0.53**	-0.27	-0.18	-0.24	-0.15	-0.18
	(0.25)	(0.23)	(0.22)	(0.22)	(0.19)	(0.19)	(0.19)	(0.22)	(0.21)
RED portions / week (post)		0.021***	0.021***	0.020***	0.0057	0.015**	0.0045	0.0019	0.0024

KEY RESULTS

✓ COACH

>>>>

0.5 lower HbA1c (on average)
compared to CONTROL & INFO

RED LIST is “poison” for diabetics

**10 additional RED portions per week
(e.g. slices of bread) >>>
0.2 higher HbA1c (on average)**



THE RED LIST

THE RED FOOD LIST ITEMS MUST BE AVOIDED AT ALL COSTS. WE DON'T EVEN RECOMMEND THESE FOODS AS A ONCE-IN-A-WHILE TREAT, AS THEY ARE HIGHLY PROCESSED AND CONTAIN UNHEALTHY ADDITIVES AND CHEMICALS.

RED ITEM FOODS WILL ALMOST ALWAYS CONTAIN INGREDIENTS THAT ARE HARD TO PRONOUNCE

THE BANTING POCKET GUIDE QUICK REFERENCE LISTS

For a more extensive list of foods, including the macro nutrient breakdown, please refer to our book The Banting Pocket Guide.

ALL PRODUCTS CONTAINING ANY OF THESE INGREDIENTS

Artta (chapatti flour)
Breaded or battered foods
Cake flour, Chickpea flour
Corn flour, Durum (wheat)
Malt, Matzo meal, Modified wheat starch
Oatmeal, Oat bran, Whole oats
Potato starch, Rice flour
Semolina, Sorghum, Soy flour
Dried beans, Couscous
Lentils, Pasta, Polenta
Rice, Sump
Split peas, Stamping
Wheat germ, Wheat starch

BEVERAGES

Canned coffee - generally containing other ingredients like dextrose, etc
Tea with added artificial ingredients
Fizzy drinks including diet or lite drinks
Cordials, Fruit drinks, Fruit juice
Shakes of any kind
Energy drinks

ALCOHOL

Beer
Ciders
Dessert wine
Liqueurs & Shooters

DAIRY

All low fat/ fat free products
Cheese spreads, Processed cheese
Canned cream, Dessert cream
Coffee creamer
Condensed milk
Custard
Flavoured yoghurt
Ice cream
Powdered milk, Rice milk, Soy milk

FATS AND OILS

All commercial fat spreads/ margarine
Flavoured butters
Canola oil, Corn oil
Cottonseed oil, Grapeseed oil, Soybean oil, Sunflower oil

SAUCES AND DRESSINGS

All commercial sauces and dressings
Barbecue sauce, Cook in sauce, Marinades, Mustard sauce, Peri-peri sauce, Pasta sauce, Salad creams and dressings
Tomato sauce
Sweet sauces

FAST FOOD AND TAKEAWAYS

Burgers, Hot dogs, Spare ribs, Crumbed chicken or fish
Fries, Wraps, Pizza, Hotdogs

MEAT AND FISH

All meat that has been cured with sugar and/or marinated meats with added ingredients
Corned meat
Cold processed meats, e.g. sandwich ham/ham/chicken/beef, etc generally found at the deli
Crumbed/battered meat, e.g. crumbed chicken, hamburger patties, chicken nuggets, meat pies, ready-made meals, meat free products (soy), fish bakes, crumbed fish fingers
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THE BANTING POCKET GUIDE

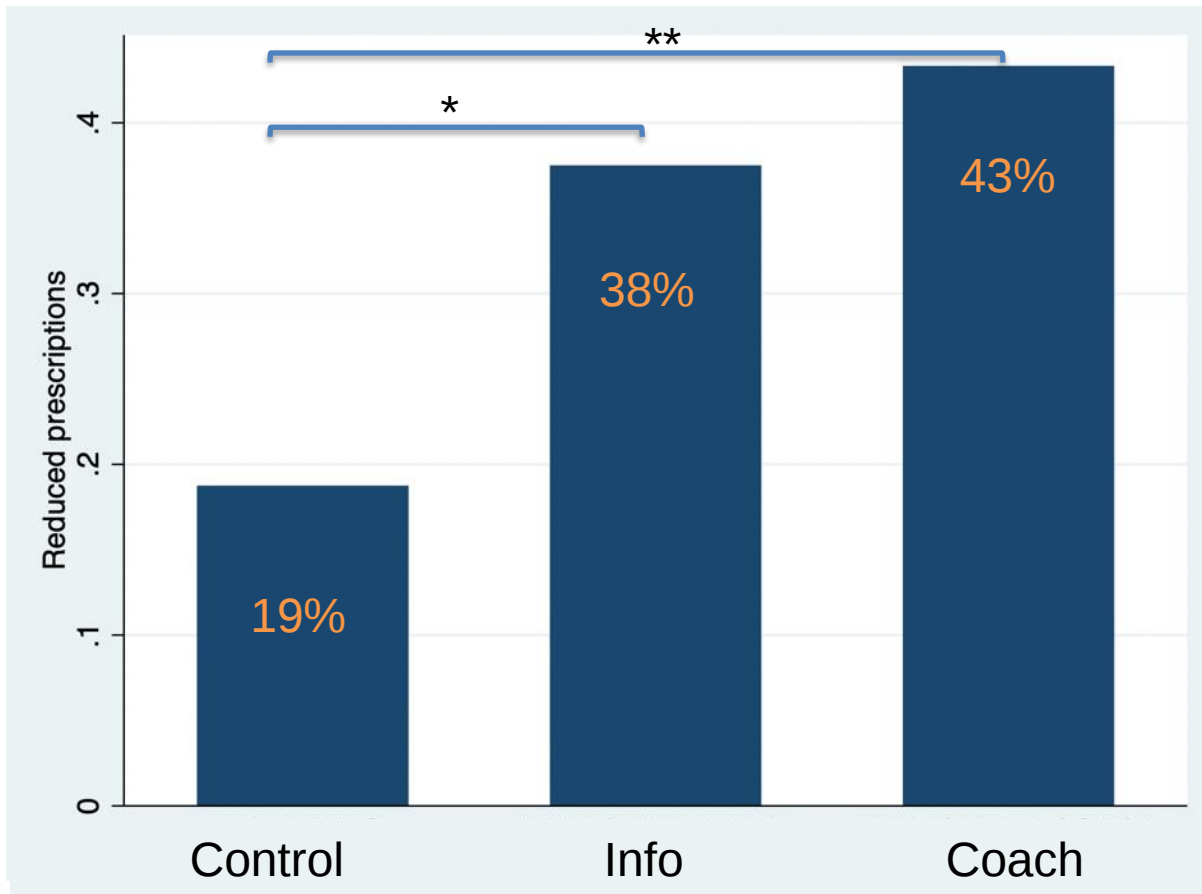


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* $p < 0.10$, ** $p < 0.05$

Note: all patients were advised to limit carbohydrates to 25g/day & avoid RED list foods

Monteiro and Larmuth et al. (in prep). Technology-assisted behavioural interventions in T2DM

Food, real-time CGM
(& coach support)
as medicine

>>>>

2x More
Deprescribing drugs!

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Key Findings

Almost everyone who took part **improved** their diabetes status and eating behaviour.

Total study remission - **46 % (HbA1c < 6.5)**

Key Findings

Unsupported real-time monitoring does not hasten treatment goals

- INFO GROUP
- Overload
- Anxiety/stress/panic
- Question every reading
- Felt abandoned without CGM

Key Findings

Minimal outpatient model for remission over 3 months

- CONTROL GROUP
- Invisible policeman
- Prepared to be without the CGM

Key Findings

Best model for outpatient treatment is highly supportive

- COACH GROUP
- Nutrition education (to include family too if possible)
- Health coaching
- Real time blood glucose monitoring.

Conclusions

FOOD CAN BE OUR MEDICINE... OR OUR POISON

Low carb diets are medicine to the sugar intolerant (a large proportion of the world)
67% of all South Africans are prediabetic and potentially addicted!

- Need a new healthcare (wellness) model to address the diabetes burden
- Standard of care doesn't reflect evidence-based "lifestyle" treatment options
- Diabetes doesn't have to be a progressive chronic disease 😊
- CGM can highlight unhealthy food choices & raise awareness of sugar spikes
- CGM is (relatively) affordable if used as a limited (short term) learning tool

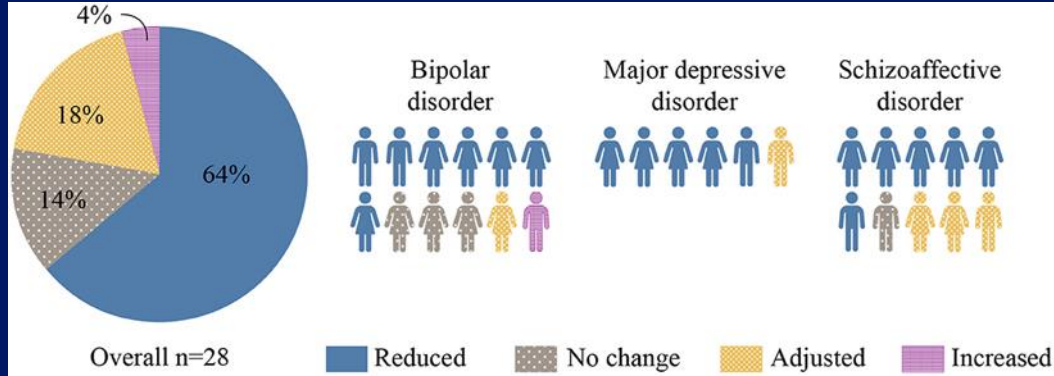


FIGURE A. Changes in Psychotropic Medication.

Changes in the number and/or dosage of psychotropic medications associated with KD intervention are represented in this figure.

The majority (64%) of participants were discharged on less medication

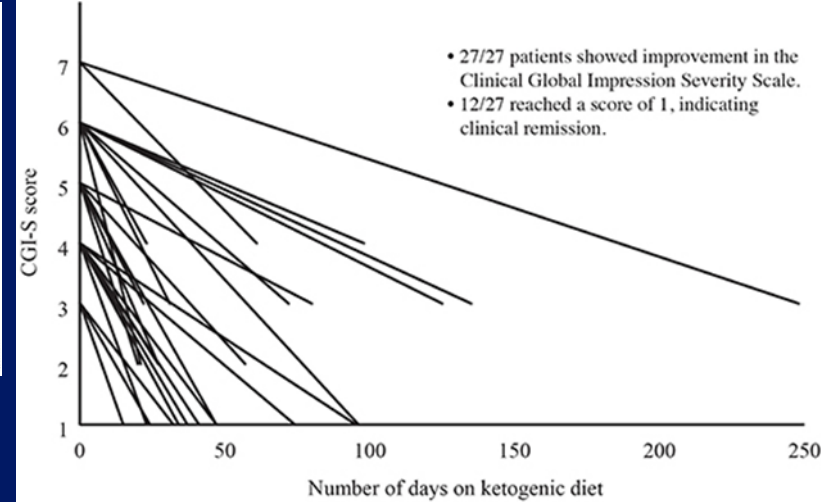


FIGURE B. Change in Clinical Global Impressions Severity Scale (CGI-S) Over Time.

Severity of illness was assessed in 27 of 28 patients using the CGI-S. The CGI-S is rated on a scale of 1 to 7, with 1 indicating normal and 7 indicating extreme illness.

Following the KD intervention, CGI-S had improved in all 27 patients, with **12 of 27 (44%) achieving a CGI-S of 1 (clinical remission)**

Mental illness

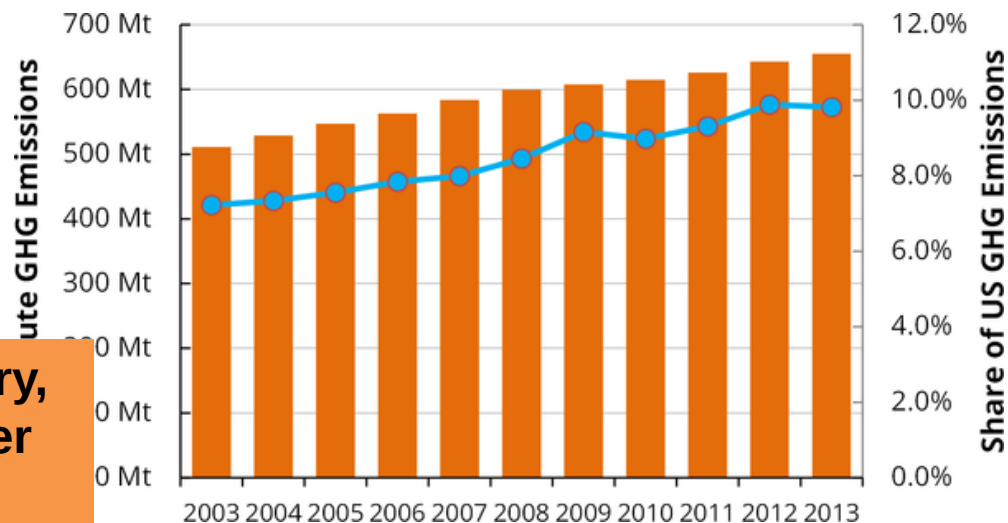
HEALTH CARE'S CLIMATE FOOTPRINT

HOW THE HEALTH SECTOR CONTRIBUTES TO THE GLOBAL CLIMATE CRISIS AND OPPORTUNITIES FOR ACTION

4.4% ~ 514 coal-fired power plants annual emissions

If the healthcare sector were a country, it would be the 5th largest GHG emitter on the planet

Fig 1. Time series of life cycle GHG emissions from US health care activities.



Eckelman MJ, Sherman J (2016) Environmental Impacts of the U.S. Health Care System and Effects on Public Health. PLOS ONE 11(6): e0157014.
<https://doi.org/10.1371/journal.pone.0157014>
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0157014>

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